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CONTENTS

Original Papers	Page
Ophthalmia Ægyptiaca. Rowland P. Wilson	397
Theoretical and practical study of the intracapsular cataract extraction. Ramon Castroviejo	406
Adenocarcinoma of the lacrimal gland. Richard H. Freyberg	417
The chemical constitution of the cornea. Arlington C. Krause	422
Glioma exophyticum. Rodolph M. Cutino and Ralph Lloyd	425
The hyaloid membrane of the vitreous. Alfred Cowan and W. E. Fry	428
Notes, Cases, Instruments	
Recurrent melanosarcoma. Charles Lukens	434
Maddox cheiroscope. H. Rommel Hildreth	436
Society Proceedings	
Memphis, Baltimore, Minnesota, Nashville	438
Editorials	
Recurrent hemorrhage into the vitreous, Wearing glasses, Prevention of eye accidents	444
Book Notices	449
Abstract Department	454
News Items	490

For complete table of contents see advertising page V

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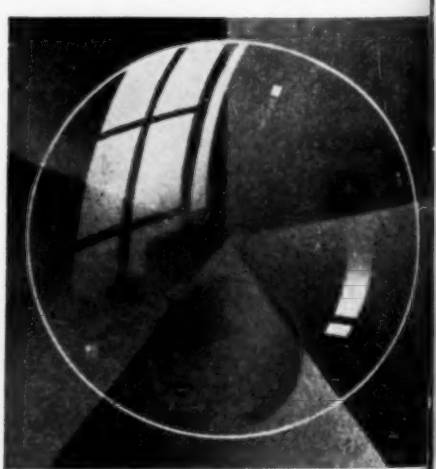

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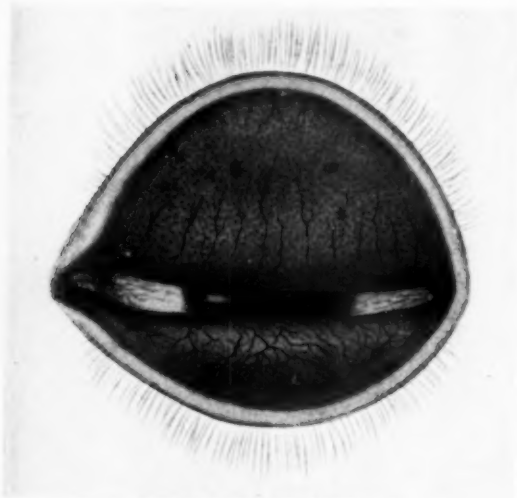

FIG. 1. PRTO-TRACHOMATOUS STAGE

FIG. 2. TRACHOMA, STAGE I. (MAC CALLAN)

FIG. 3. TRACHOMA, STAGE IIa. (MAC CALLAN)

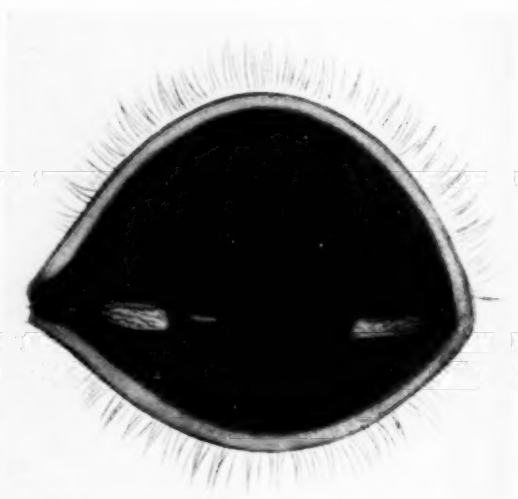

FIG. 4. TRACHOMA, STAGE IIb. (MAC CALLAN)

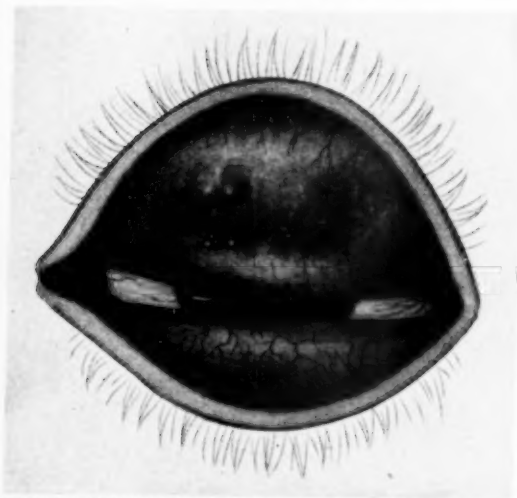

FIG. 5. TRACHOMA, STAGE III, WITH "FOST-TRACHOMATOUS DEGENERATIONS." (MAC CALLAN)

FIG. 6. TRACHOMA, STAGE IV. (MAC CALLAN)

AMERICAN JOURNAL OF OPHTHALMOLOGY
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OPHTHALMIA ÆGYPTIACA

ROWLAND P. WILSON, F.R.C.S. (Edin.)
CAIRO, EGYPT

This description of trachoma as seen in Egypt, with the conditions easily confused with it, and the plates showing the different stages, suggested by Dr. A. F. MacCallan and commonly recognized in the ophthalmic hospitals, was presented by Dr. Wilson, Director of the Giza Memorial Ophthalmic Laboratory, at the meeting of the Colorado Congress of Ophthalmology and Otolaryngology in Denver, July, 1931.

Although the subject of my address today is perhaps rather a vague one, I have, nevertheless, chosen it expressly because it gives me the opportunity of bringing to your notice a few interesting details of the various ophthalmias which are so exceedingly prevalent in Egypt.

It is perfectly clear that the ancient Egyptian surgeons and the Greeks recognized a difference between the acute ophthalmias and trachoma, which is essentially a chronic disease; but it would appear that the difference was lost sight of, even as late as the beginning of last century. Larrey, who was surgeon-in-chief to Napoleon I during his campaigns in Egypt, has given us in his work "Memoires de Chirurgie Militaire et Campagnes" a vivid account of the epidemics of ophthalmia, which broke out amongst the French troops in Egypt; and his records show that the disease was then regarded as trachoma. But his descriptions exactly correspond with the present day yearly epidemics, not of trachoma, but of purulent ophthalmia.

In the early days of last century, therefore, all the various acute inflammations of the conjunctiva, which we are now so readily able to distinguish by bacteriological, if not by clinical means, were included under the name of "Ophthalmia Aegyptiaca" and were regarded as identical with trachoma. By reason of the advances in bacteriological knowledge, this confusion should cease to exist and the term, if used at all, should be restricted to trachoma alone. But before I go on to consider certain of the more interesting facts about trachoma as it is seen in Egypt, I should like to draw your attention to some striking features of the purulent and mucopurulent ophthalmias common in that country.

It is quite true that such organisms as the diphtheria bacillus and the pneumoccus give rise to severe forms of purulent conjunctivitis, but these are of very rare occurrence. When one speaks of an acute purulent, or mucopurulent conjunctivitis in Egypt, one invariably thinks of the type due to either the gonococcus or the Koch-Weeks bacillus. The diplobacillus of Morax-Axenfeld is a nonpyogenic organism, and where it is associated with a purulent ophthalmia this is always due to some other superimposed infection. The diplobacillus may, however, give rise to acute symptoms but the form of the disease produced by the organism is almost invariably a chronic one.

Morax-Axenfeld conjunctivitis

Morax-Axenfeld infection of the conjunctiva is an extremely common condition in Egypt, much more common than is often admitted, no doubt because the clinical signs of the disease are often so slight as to be readily overlooked, or attributed to other causes such as trachoma, or simple irritation

Erratum: Legend of figure 1 on opposite page should be "Proto-trachomatous stage."

by dust and wind. The organism may be found on as many as 40-50 percent of the conjunctivæ of the people; and the one form of conjunctivitis in Egypt which is most apt to spread to the eyes of Europeans is undoubtedly that due to the Morax-Axenfeld bacillus. It is a remarkable feature that English and American residents in Egypt practically never contract trachoma, or gonococcal opththalmia; but the same is not true for the Morax-Axenfeld and the Koch-Weeks bacillus, especially for the former.

The Morax-Axenfeld diplobacillus does not show any very definite seasonal incidence although it is more readily found in conjunctival secretions during the winter months; and, relatively to other organisms, it is seen more frequently during these months. Doubtless the reason why this bacillus appears from Plate 3 to be more common in the summer is because more conjunctival smears are examined during the summer, owing to the prevalence of the acute ophthalmias. (It is the common practice in the Egyptian Government Ophthalmic Hospitals to examine smears from all cases of acute conjunctivitis.)

Ulceration of the cornea is sometimes seen in diplobacillary infections of the conjunctiva complicated with trachoma; but Morax-Axenfeld conjunctivitis does not constitute a serious factor in the eye diseases of Egypt.

Of infinitely more serious moment is that due to the gonococcus and the Koch-Weeks bacillus. There is little doubt that at least 75 percent of the blindness in Egypt is due to this cause and thus much of the blindness can easily be prevented.

Koch-Weeks and gonococcal conjunctivitis

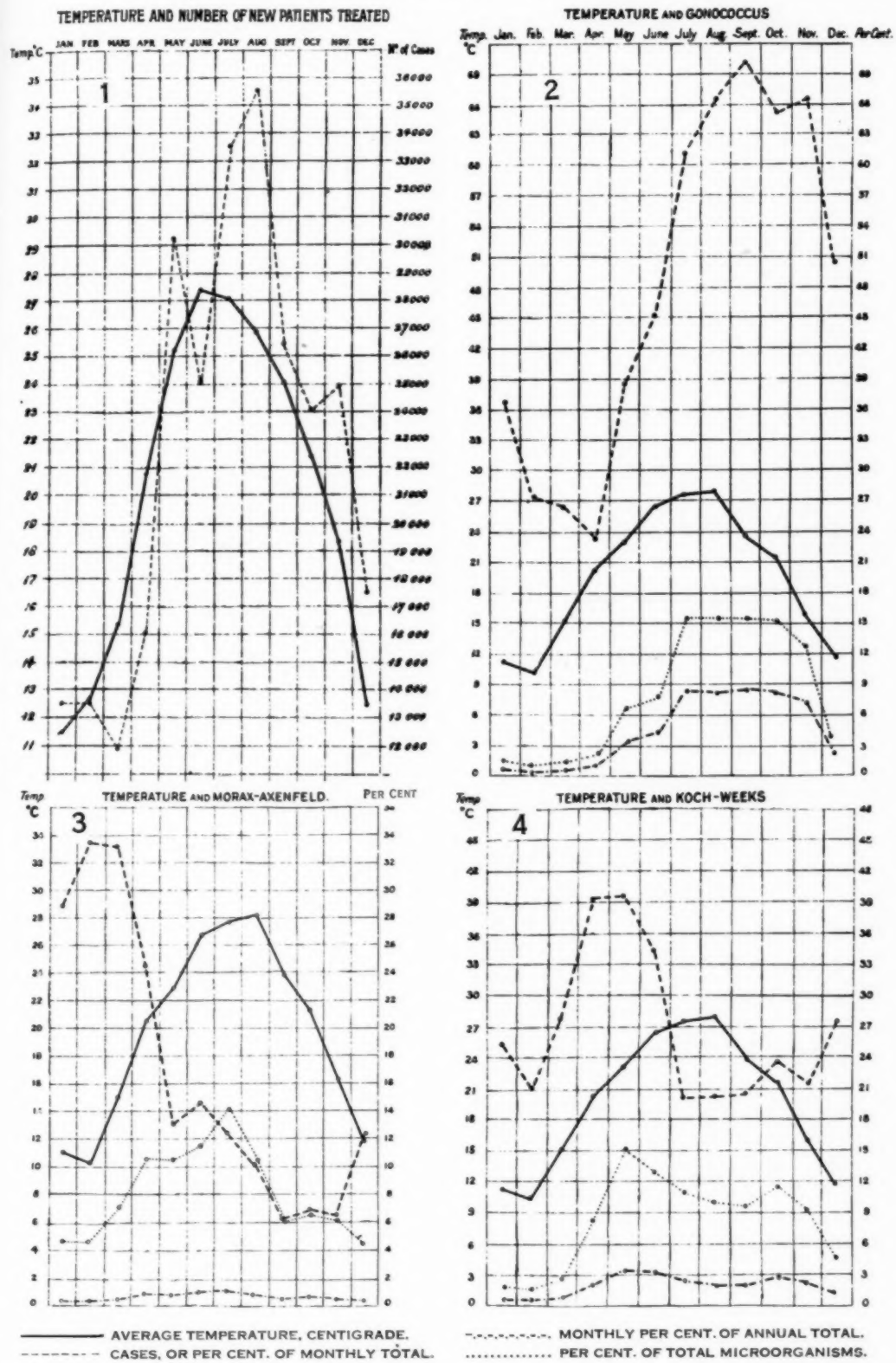
The striking feature of gonococcal conjunctivitis is the severity of the inflammation, the swelling of the conjunctiva and the extreme rapidity with which serious corneal lesions occur. These features are not nearly so prominent in Koch-Weeks conjunctivitis, and I very much doubt if this organism really gives rise to much ulceration of the cornea. Both types of infection are seen much more commonly in children than in adults; indeed we have estimated that, in the villages of Egypt, very few children by the time they have reached the age of five years have escaped an attack of mucopurulent conjunctivitis.

With regard to the gonococcal infection it must be noted that it is not of venereal origin, although morphologically, culturally, and serologically, the organisms isolated from the conjunctiva and the genitals are similar. Although gonococcal conjunctivitis is so common in Egypt, it is remarkable to note that cases of ophthalmia neonatorum are of the rarest occurrence.

The seasonal incidence of these acute inflammations is also a very regular and striking feature. In the first place if we consider, for example, Graph I, Plate 3, (taken from the Egyptian Government Ophthalmic Hospitals Report) which shows in graphic form the number of new patients treated monthly, as compared with the mean monthly temperature, we shall note that there is a very intimate relationship between the two curves, the details of which are strikingly constant from year to year. Very shortly after the first hot days begin, usually March-April, there is a very rapid increase in the number of patients, the increase being due to the increasing prevalence of acute conjunctivitis. The number of patients rises to a peak usually in the month of May after which there is always a temporary fall despite the fact that the heat of the summer continues. Indeed the temporary fall usually reaches its lowest point when the summer heat is greatest. Afterwards the number rises again and reaches a maximum for the year, usually in August although the monthly mean temperature by that time is falling. This also is followed by a temporary drop in the numbers, only to rise again, usually in October although to a lesser extent, before the final fall to the small numbers in January.

What then is the reason for these three peaks in the curve and why does the number fall in the very hot

TEMPERATURE AND ACUTE OPHTHALMIAS IN EGYPT (WILSON)



weather? I believe the reason for the latter to be two-fold. If we could show here a graph similar to that shown in Graph I, but drawn up for the hottest towns in Egypt, e.g., Asswan, we should find the depression in the graph during the hottest months to be very much deeper than that shown in Graph I which is for *all* the Egyptian Government Ophthalmic Hospitals. Indeed, in places like Asswan, where the temperature often rises to 40°-44° C., cases of mucopurulent conjunctivitis are but rarely seen in the summer. Doubtless the extreme heat is inimical to the propagation of the infecting organisms. That this is so is further supported by the fact that the gonococcus not only ceases to grow at 38.5° C.; but also is killed after a brief exposure to a temperature of 41°-42° C. Secondly, I believe that flies are important carriers of infection and it is just at this time that they are less numerous. There are two distinct breeding seasons for flies in Egypt, namely about April and September, and it is about these very seasons that we always find a rise in the type of curve we have been considering (Graph 2). This is not merely a coincidence, because it happens so regularly.

The first rise in the curve is mainly due to cases of Koch-Weeks conjunctivitis, which is most prevalent in the spring (Graph 4), and the final rise in the curve is mainly due to the gonococcus, which is more prevalent in the autumn. These facts are best noted in graphs 2 and 4. The second, or middle peak in the curve, is always the highest, being due to the waning numbers of Koch-Weeks conjunctivitides, but increasing numbers of gonococcal conjunctivitides, both of which are actually high at the time. Both of these organisms are usually noticed only in acute infections, but it is remarkable to note that they may also give rise to mild chronic lesions. Especially does this apply to the Koch-Weeks bacillus. During the winter months of the year, for instance, one may find in the villages large numbers of young patients who merely have a slight chronic conjunctival catarrh, but in whose conjunctival sacs swarms of Koch-Weeks bacilli may be found. In a recent investigation in a certain village, it was found that practically all the infants who at the time had no trachoma, nevertheless suffered from a very mild conjunctival catarrh of Koch-Weeks origin. This, and the fact that in children trachoma often becomes apparent after an acute conjunctivitis has subsided, has given rise to the view that trachoma may after all be only the result of a chronic infection with simple organisms; and also that the Koch-Weeks bacillus may have an intimate relationship with the disease. It is true that after an acute attack of conjunctivitis (Koch-Weeks or gonococcus) trachoma may be seen in the patient for the first time; nevertheless, we have often seen trachoma develop without the previous existence of an acute attack, and also without any definite pre-existing infection with pathogenic organisms.

Trachoma

It is our opinion that trachoma is an infectious disease *sui generis*, and that preceding infections with other organisms are not necessary precursors of the disease. At the same time, we believe that the trachoma virus will flourish more readily on an unhealthy conjunctiva, and likewise that mixed infections are probably potent causes of the spread of trachoma.

In Egypt by reason of the frequency of mixed infections and conjunctival irritation due to dust, wind, and glare, it is impossible to diagnose with absolute certainty the very earliest stages of trachoma. After an indefinite period, however, certain signs appear by which we are enabled to state that trachoma is definitely present. These we shall note later but there always exists, before the appearance of the first diagnostic features, a stage which we have noticed always develops into true trachoma, but which is practically indistinguishable from a mild chronic conjunctivitis. This I have called the "prototrachomatous" stage (Plate 2, Fig. 1).

When one considers trachoma as it is seen in the East the conception that

the disease is a local expression of a constitutional derangement, namely that it is merely part of a general "adenoidism", appears to be completely untenable. One may find larger follicles in the retrotarsal folds in such cases but here we have to be careful to decide whether we are dealing with pure trachoma, and not with a follicular conjunctivitis or a mixed condition. The presence of large follicles in the fornices does not necessarily mean trachoma. Lymphatism is characterised by a general hyperplasia of lymphatic tissue. If then trachoma is related thereto, we should expect to find a different histopathological picture from what we actually find in trachoma. In the histopathology of trachoma, at least as it is seen in the East, the presence of lymphocytes is not a predominating feature, but we shall return to a consideration of these points later.

In Egypt, trachoma is pandemic. In the villages 100 percent of the indigenous population is affected. It affects all classes with the possible exception of the highest society. Even in the middle classes it exists to the extent of 90-95 percent. Amongst English and American residents trachoma is an extremely rare disease; but amongst Greeks, Italians, French, and others, it is quite common; 10-20 percent (Sobhy).

The age of onset amongst the general population is very early, for when one examines the youngest school children one finds advanced stages of the disease with much cicatrization, and even in children five years of age one may find the cicatrization complete. In such cases, however, the infection has usually been a very mild one, so much so that a positive diagnosis of healed trachoma is sometimes problematical. As a general rule we may say that in the villages trachoma manifests itself before the child is one year old.

The actual age at which definite signs of trachoma first appear, also seems to depend upon the time of year in which the child is born; for example, children born in the hot summer months develop trachoma at an earlier age than those born in the winter months. The average age of onset in the former is about four to five months and in the latter it is about seven to eight months. Thus we find that the onset of trachoma is particularly manifest in the autumn, August being the month of highest incidence. There is, however, no rigid seasonal incidence as it may appear in any month of the year.

In the majority of cases there is a preceding organismal conjunctivitis, either chronic or acute, commonly Koch-Weeks (generally speaking infections with the latter organism are much more common than with the gonococcus) but we have nevertheless seen many cases of trachoma develop without a definite previous organismal infection. There can be no doubt, however, that a preceding mixed infection assists the earlier appearance of trachoma.

Clinical appearances of trachoma

In view of the fact that the clinical appearances of so-called trachoma in various parts of the world appear to differ so considerably, doubt has often been expressed as to whether it is all one and the same disease, and until some specific microorganism, or virus is established to be the cause of trachoma, it is obvious that we must continue to remain in doubt.

In Fuchs' textbook of ophthalmology, for instance, we find in the opening sentence on trachoma these words—"Trachoma is an inflammation of the conjunctiva which originates by infection and produces an infectious purulent secretion". Regarding the latter observation this is not the case in Egypt. Trachoma in Egypt is essentially a chronic disease and generally commences and often progresses so insidiously that the patient is unaware of his infection. Trachoma in that country never produces a purulent discharge, and if such be present it is always due to some other superimposed infection. Trachoma does, however, often produce acute symptoms like photophobia and lacrymation, but this is only when pannus with keratitis, or ulceration is present. The corneal affection is, how-

ever, of such importance that we shall deal with that subject later.

The most prominent feature of trachoma in Egypt is the marked tendency to cicatrization and to early spontaneous cure. This is particularly seen in the people who can afford to send their children to school.

Egyptian ophthalmologists have adopted and continue to adopt Raehlmann's classification as modified by MacCallan. Such a classification although serving admirably as a useful and practical classification does not meet all the clinical facts and might therefore be amplified or, as would probably be better, simplified. If we were to develop a classification to meet all the various appearances that one may find in trachoma it would not only be very complicated, but also clumsy and unwieldy. In the Fourth Annual Report of the Giza Memorial Ophthalmic Laboratory, I enlarged upon MacCallan's classification in order to show the extent to which the clinical changes in trachoma may vary but not to establish a new classification. Simplicity is what should be aimed at.

In the above report I have referred in detail to the early appearances of definite trachoma, but it would seem that there is a preceding stage (which I have called the prototrachomatous stage) which is always present before definite follicles are evident. The appearances in this stage may, however, be exactly simulated by certain other forms of conjunctivitis and therefore cannot be regarded as diagnostic of trachoma only. We may, however, trace the early stages of trachoma as follows.

Prototrachomatus stage

In this stage one finds that the earliest changes are in the network of the conjunctival vessels in the upper tarsal conjunctiva, the descending perforating branches from the superior tarsal arch and the ascending perforating branches from the inferior tarsal arch all becoming slightly congested and therefore more prominent to the naked eye. At the same time the capillary vessels ending in the tarsal conjunctiva, which is normally perfectly transparent and practically colorless, begin to become more evident until ultimately they appear as very fine, tiny, red punctations, stippled over the whole of the tarsal conjunctiva and massed together in polygonal and hexagonal areas separated by a network of pale linear spaces, thus forming a kind of mosaic (Plate 2, Fig. 1). With the advance of these appearances the conjunctiva loses its normal transparency and the ascending and descending arterial branches become entirely hidden by the congestion of the capillaries, the descending branches being those to disappear last. By this time or a little sooner, however, it is probable that stage I has become definitely established.

Stage I (MacCallan)

In this stage, in addition to the above appearances, tiny grayish-white areas are to be seen scattered here and there over the tarsus (Plate 2, Fig. 2). These are the earliest visible follicles and constitute the first definite signs of trachoma. Encircling, or practically encircling, each of these tiny follicles may be seen a fine blood vessel which usually courses in a whorled fashion to end in the center of the follicle.

At first there are only one or two of these pale areas but gradually they increase in number until they become very numerous. They are seen in the tarsal conjunctiva only, and at first remain quite flat. As the condition progresses, however, the tarsal conjunctiva becomes very finely granular and velvety, owing to the formation of tiny papillæ. This granularity increases with time and becomes particularly marked as one passes from the lid margin to the upper border of the tarsus, where it is always most marked. It is then that the follicles stand out on the tarsus and produce a coarsely granular appearance.

While the various changes have been taking place in the tarsal conjunctiva, the retrotarsal conjunctiva has also become more congested and redundant so that it becomes raised usually into more or less marked horizontal folds on the tops of which relatively large elevations appear at a very early period in

the disease. These elevations or follicles become more and more marked and appear to spread down over the upper edge of the tarsus merging into the appearances already described. (Plate 2, Fig. 3).

With the progress of the disease the follicles in the retrotarsal folds become more definitely localized, grayish and translucent, protrude markedly on the surface and frequently rupture spontaneously. This is the stage described as stage IIa.

Stage IIa (MacCallan)

As will be seen however, this is not exactly a stage following the completion of stage I, but only a more gross form of stage I. The pathological findings also confirm this. Furthermore, so-called stage IIa rarely occurs alone, but almost always in conjunction with the appearance of stage I or stage III. This is naturally what one would expect from what has just been said.

The objective symptoms in this stage do, however, appear to differ slightly from stage I, especially in regard to the type and amount of discharge from the eye. In fact, it is so characteristic that one can tell at a glance that the patient is suffering from trachoma stage IIa, without even everting the lids. In stage I the discharge is watery with a slight amount of mucus, but in so-called stage IIa, it is more mucoid and very sticky, and when it escapes on to the outer surface of the eyelid and dries, it produces a yellowish glazed film on the skin. Flies appear to be greatly attracted by this discharge, and one sees more of them around eyes in this stage than in any other stage. It is also the most infective stage and therefore incidentally, so far as Egypt is concerned, flies must be important carriers of this disease.

Stage IIb (MacCallan)

At times, however, the papillary hypertrophy which is invariably present almost from the commencement of the disease, becomes exaggerated to such an extent that the follicles become obscured to the naked eye by the papillæ. Where this papillary hypertrophy of the conjunctival mucosa predominates the condition is described as belonging to stage IIb of the disease (Plate 2, Fig. 4). It must be remembered, however, that this hypertrophy is also invariably present in stage I, but to a less obvious degree.

Follicles therefore of the IIa type and even of the I type may exist at the same time in cases of so-called type IIb. It is rare, however, to find in marked cases of type IIb large translucent expressible follicles in the fornix. Such cases therefore resist ordinary mechanical treatment, and only respond satisfactorily to combined excision of the tarsus and conjunctiva.

It is not difficult to distinguish this stage from pure spring catarrh; but it may be difficult to distinguish it from the mixed condition. It does not seem necessary, however, to make a separate subdivision for such a condition, nor for that matter when the disease is associated with a gonococcal infection. Spring catarrh and the gonococcus may also be seen implanted on both stages I and III. In any of the above mentioned stages, either at a very early date or after a prolonged period of congestion, evidences of cicatrization (Plate 2, Fig. 5), or scarring may appear.

Stage III (MacCallan)

It is exceedingly difficult to offer any explanation as to why some patients should develop severe lesions as a result of a trachomatous infection, and likewise it is impossible to state why some patients are affected so mildly. Cases, particularly amongst school children, are commonly seen where stage I has evidently passed directly into stage III, and thus on to complete cicatrization, leaving only very slight traces of a previous trachomatous infection. It is therefore very common to find well formed cicatrices in cases of both stages I and II (Plate 2, Figs. 1 and 3). This early cicatrizing process is a marked feature in Egyptian trachoma. It is naturally when such changes begin to take place that one finds complications beginning to arise, such as trichiasis, entropion, and the like.

Stage IV (MacCallan)

This stage is merely the final stage of the disease, in which complete healing has occurred. The conjunctiva is quite smooth and is whiter than normal, as a result of the scar formation, and the obliteration of the fine capillary vessels which normally end in the conjunctival mucosa (Plate 2, Fig. 6). Such patients are not prone to reinfection but no true immunity appears to be conferred by a previous attack, for I have seen stage I reappear in an apparently perfectly healed conjunctiva.

The scarring in stage IV may be very dense, producing serious distortion of the upper eyelid; or it may be so fine as to render the diagnosis of a previous attack doubtful. Fine scarring of the conjunctiva is in itself not pathognomonic of the disease, for such may be seen following severe acute purulent ophthalmia.

From the point of view of the conjunctiva alone it is, however, very suggestive of a previous attack of trachoma if the ascending perforating vessels are shortened, contracted or effaced, if the descending vessels no longer preserve their more or less regular arrangement but are tortuous and irregular, and when large anastomosing vessels are to be seen on the tarsus.

Furthermore I have usually found that in these doubtful cases the normal gentle concavity of the subtarsal sulcus is definitely deepened, in many cases to the extent of being quite angular. One sometimes finds, however, that it is practically impossible to state from these signs alone that trachoma has previously existed. In the absence of characteristic scarring, I believe that the corneal signs are of greater diagnostic importance.

Corneal changes in trachoma

Are changes in the cornea an essential part of the clinical picture of trachoma, or are they only a complication of the disease? This is a question which has frequently arisen and regarding which there is considerable difference of opinion, possibly because of the confusion in the terminology employed to describe such changes. The term "trachomatous pannus" should be restricted to those cases in which there is definite, visible, new formation of vascular granulation tissue, similar to the subepithelial infiltration found in the conjunctiva. Such an appearance may be more or less marked; if it is gross the case is severe; but there are very many cases which never develop this type of corneal change at all.

All cases do, sooner or later, show the formation of new vessels in the cornea. I have never seen a case that did not. This in mild cases may amount to only a few short new vessels in the upper part of the limbus, but as a rule these extend well into the pupillary area. In such cases the advance of the new vessels into the cornea may progress very slowly, and without definite pannus formation according to the strict sense of the word. While true trachomatous pannus may not be present in every case. I do maintain that vascularization of the cornea, to a greater or lesser degree, will always be found, and this I believe commences at a very early date in the infection. If, however, from the very beginning of the disease thorough and effective treatment is employed, these changes may be almost entirely avoided.

Recently I have had the opportunity of keeping under observation a number of infants right from birth, and we have not been able to confirm the opinion of others that vascularization of the cornea is a common sequel of mucopurulent ophthalmia. On the contrary we have not seen it in such cases but only in trachoma. Indeed, we have at times found definite new vessel formation commencing almost synchronously, with the first definite signs of trachoma in the palpebral conjunctiva. In any case one always expects to find new vessels in the cornea, within the first two or three months from the appearance of the first signs in the conjunctiva.

Other important changes which occur in the cornea or limbus, especially in the upper part, are the peripheral follicles or infiltrations which are so common in this disease. Similar peripheral infiltrates are frequently seen in stru-

mous keratitis; but I cannot remember ever having seen the typical pits first described by Herbert follow such a condition. This marginal pitting is very typical of trachoma. Sometimes they show as clear, facetted, circular areas, in the semi-opaque limbus; at others merely as clear, transparent areas in the limbus without facets, or as semicircular notches in the limbus giving it a crenated appearance, although at times only one or two notches may be seen.

In healed trachoma one also invariably finds a flattening of the curvature of the upper part of the limbus or, to be more correct, a crescentic opacity of the upper part of the cornea continuous with the sclera. It is quite common especially in infants to find a similar semi-opaque crescentic opacity, but this is never so opaque as is seen in trachoma.

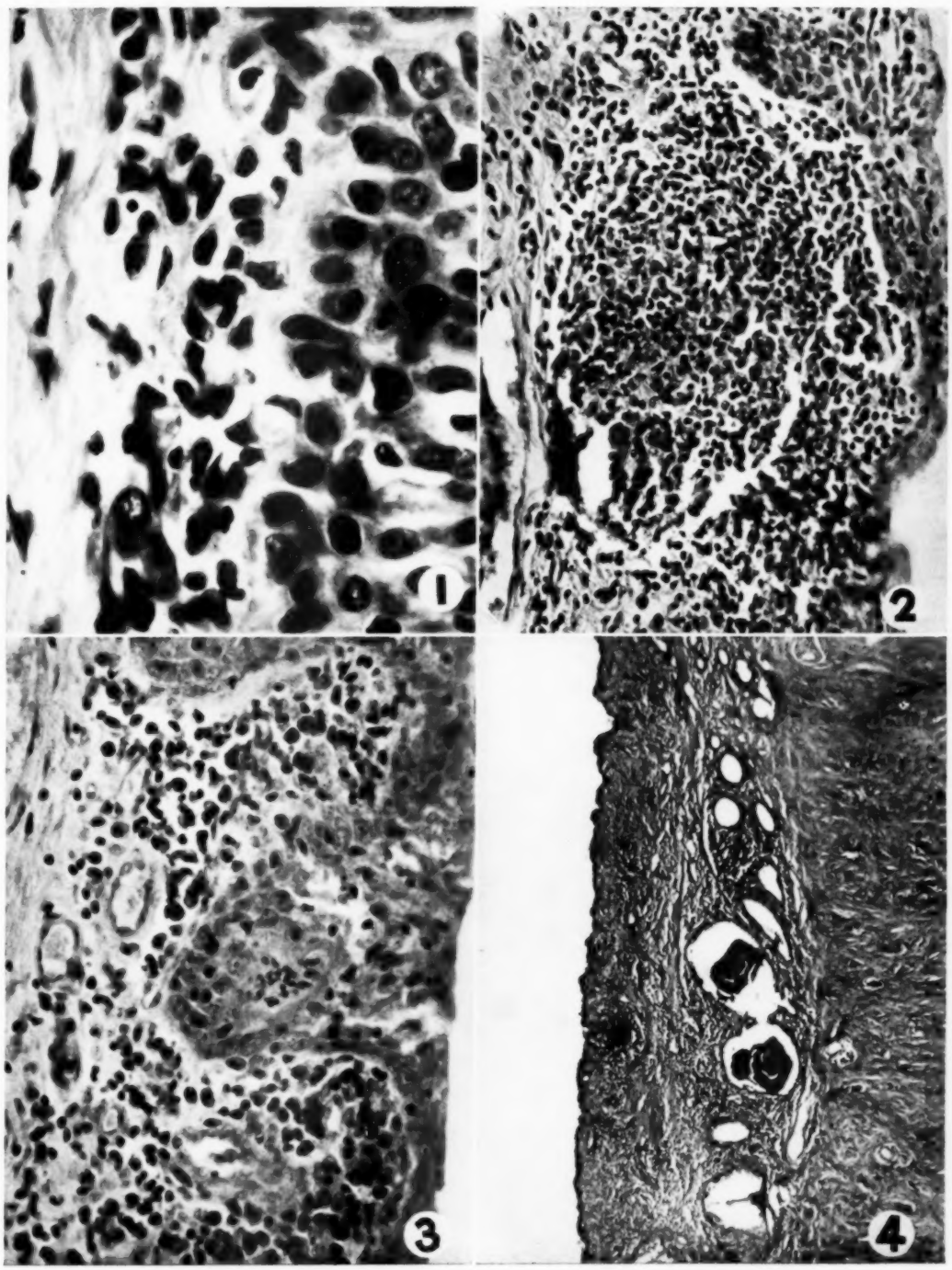
Histopathology of trachoma (Plate 4)

Finally, I wish to describe briefly the histopathology of trachoma. This has already been done by many different writers, but I have not been able to find in the literature a detailed statement regarding the histopathology of Egyptian trachoma. It will, therefore, be of interest to note if there is any fundamental difference between this and American Indian trachoma.

Naturally the histological characters in any case depend largely upon the age of the lesions. The earliest visible changes in trachoma are to be found in the subepithelial strata and simply consist in the congestion of the vessels, especially of the preexisting fine capillary branches, but evidence of new capillary formation soon appears. A little later it is evident that the deeper tissues also share in the inflammation, for both in the subepithelial tissues and also in the tarsus itself, a perivascular round-celled infiltration becomes manifest. The type of cell first to show increase in numbers is the lymphocyte, but other types of cell, such as plasma cells and young endothelioid cells or mononuclear cells, appear almost at the same time. (Plate 4, Fig. 1). With the increasing subepithelial infiltration, plasma cells and young endothelioid cells, many of which may be seen actively dividing, soon predominate and lymphocytes thereafter do not occupy a prominent place in the histological picture. One often finds plasma cells packed together into tiny agglomerations not only under the epithelium (Plate 4, Fig. 2) but in the deeper tissues including the tarsus. From a very early stage in the disease, therefore, plasma cells play a very important rôle and are always present in great numbers.

The epithelium at first shows little change but afterwards a few plasma cells, young endothelioid cells, and polymorphonuclear leucocytes may occasionally be found between the epithelial cells (Plate 4, Fig. 3). The polymorphonuclear cells are doubtless due to a superimposed mixed infection and do not enter into the histological picture of the subepithelial tissues. As the condition progresses, mucoid activity in the epithelial cells increases, as shown by the increase in the number of goblet cells, and epithelium. As the subepithelial tissues become more infiltrated, the conjunctival mucosa assumes a more or less papillary appearance and presents the appearance of epithelial downgrowths or crypts (Plate 4, Fig. 3).

These frequently become blocked or cut off and then one often sees in the subepithelial infiltration small epithelial cysts filled with polymorphonuclear leucocytes and epithelial debris. In the later stages of the disease degenerative changes with calcareous deposits appear in these cysts and give rise to yellowish gritty concretions underneath the conjunctiva (Plate 4, Fig. 4). These are the so-called "post-trachomatous degenerations" (or P.T.D's) so frequently spoken of in Egypt. They are, therefore, not the result of degenerative changes in trachoma follicles, but in epithelial pseudo-cysts. As we have already noted, the general infiltration is not confined to the sub-mucosa but also invades the tarsus. Indeed trachoma is also a tarsitis and it is surprising to note, as a result of the inflammatory process, how early reten-



LESIONS OF TRACHOMA AT DIFFERENT STAGES (WILSON)

tion cysts in Krause's and the Meibomian glands appear.

In the early stages of trachoma the pathological changes simply consist of a generalized subepithelial infiltration in which plasma cells and young actively dividing endothelioid cells predominate. (Plate 4, Fig 3). There are, however, a few lymphocytes, a few large endothelioid cells and an occasional mast cell in the deeper tissues. Lymphocytes are rather more prominent in the retrotarsal fold where lymphoid tissue is normally found.

The first signs of trachoma follicles usually appear in the deeper parts of the subepithelial tissue as small aggregations of lymphocytes, plasma cells, and young endothelioid cells. These increase in size chiefly as a result of the increase in the numbers of the mononuclear or young endothelioid cells at the same time as the plasma cells in particular disappear from the center of the follicle. The lymphocytes become arranged chiefly towards the periphery of the follicle amongst which a few plasma cells may also be seen. There appears to be no new supporting stroma in the follicle; this only becomes manifest in a later stage—in the cicatricial stage—when fibroblasts begin to invade the follicle.

In well-developed follicles degenerative changes are always present in the central cells, and often the center of the follicle is occupied by ill-staining necrotic material. Large phagocytic cells may also be seen, some of which contain nuclear debris (Leber cells). Plasma cells are rarely seen within the fully formed follicle, indeed by this time the follicle consists almost entirely of young endothelioid cells and a few epithelioid cells. If there are any lymphocytes at all they are confined to the periphery. The trachoma follicle does not possess a true capsule nor have we been able to distinguish any definite endothelial lining, but as a result of pressure the follicle often shows a more or less well-defined fibrous capsule.

The follicles either rupture spontaneously (and this is a very important point in the differential diagnosis between trachoma and follicular conjunctivitis) or else are gradually absorbed with or without the formation of scar tissue. Usually the necrotic tissue is replaced by scar tissue which invades the follicle from without.

These appearances describe the histological changes seen in stages I and IIa. In stage IIb the infiltration is always of a very striking character. Here the papillæ are literally packed with plasma cells which are found in various stages of degeneration. Practically no other type of inflammatory cell is seen in such cases. Endothelioid cells are very few in number but numerous mast cells may be seen in the deeper tissues. Where the hypertrophy is very marked the condition might almost be described as a plasmoma.

In Egyptian trachoma, however, marked fibroblastic reaction begins to appear at a very early stage and ultimately replaces the degenerative changes which have taken place in the inflamed tissues (Plate 4, Fig. 4). Sometimes, however, the tissues undergo extensive hyaline and amyloid degeneration in which calcareous changes frequently occur. I have actually seen a tarsus wholly converted into calcareous and bony tissue.

From the histological point of view, there is really very little to distinguish the early stages of trachoma from other follicular conditions of the conjunctiva, although I do believe that in simple follicular conjunctivitis one finds a more marked proportion of lymphocytes. In follicular conjunctivitis, as a result of some kind of irritation, an enlargement of the normal lymphoid follicles takes place and the lymphoid aggregations remain more or less localized but in trachoma there is more evidence of a wide-spread inflammatory reaction resulting in a marked generalized subepithelial infiltration. Of much greater diagnostic importance, however, are the degenerative, cicatricial and corneal changes which invariably follow in trachoma, but which never occur in follicular conjunctivitis.

I have dealt at some length on the ophthalmias of Egypt and particularly on those features of trachoma which

are of importance from the diagnostic point of view. We now have to decide if trachoma in the Orient is essentially the same as trachoma amongst the American Indians. The evidence in favour of Bacterium granulosis being etiologically related to trachoma of the Indians is very strong.

If trachoma in other countries is exactly the same, we may therefore hope for an early and complete solution to the age long problem of this disease.

THEORETICAL AND PRACTICAL STUDY OF THE INTRACAPSULAR CATARACT EXTRACTION

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A critical study is presented of the four methods of cataract extraction most employed, namely, the classical extracapsular method and the three intracapsular methods, Smith Indian, forceps, and suction. The advantages and disadvantages are set forth on theoretical grounds and on the basis of results reported by the leading exponents of each method and of the author's experience. Read before the Section on Ophthalmology at the third Pan-American Medical Congress, Mexico, July 23, 1931. From the department of Ophthalmology of the College of Physicians and Surgeons, Columbia University.

The selection of the proper operation for cataract extraction has always been a great problem in Ophthalmology and the object of many different opinions, but in the last few years the controversy has increased, due especially to the development of intracapsular extraction. The subject is still a moot question, and the controversial literature is not convincing. The confusion of ideas about this very important problem is especially disturbing to those who are trying to find the method most applicable to the different cases.

Analysis of the papers published reveals in many of them, considerable favoritism while pointing to the advantages of their own method, the authors expose the numerous defects and complications of the others without sufficient personal experience in the methods which they criticize.

Other papers are based on a limited study of a few cases, and the complications are attributed to the methods themselves, when in reality they are due to the omission of additional details that are necessary adjuncts to the method. These details facilitate the operative success and decrease the common postoperative complications.

With my father, who was my first teacher in ophthalmology, I had the opportunity of familiarizing myself with the classical method, and later was able to study cases operated on by the Indian method of Smith. This procedure had to be abandoned because of more inconveniences than advantages. After Barraquer[1], in 1917, had presented his first report on extraction of cataract with the erisiphake, my father began to extract with the vacuum apparatus of Barraquer, and the one modified by Muñoz-Urra[2], and presented a criticism of this method in the years of 1919[3] and 1920[4]. Since then he performed a sufficient number of such operations to obtain statistics which did not show any superiority to capsulotomy. Perhaps it was due to instrumental imperfections at that time, or to the absence of details which have influenced so much the development of intracapsular cataract extraction.

In 1927 I began to study extraction of cataract with forceps, using the Verhoeff forceps, modified from Kalt forceps, and in 1929 I published my first paper with statistics of one hundred cataract extractions[5] of which seventy percent were intracapsular. The resulting visual acuity in these was very superior to that obtained by the classical method, and the postoperative complications were markedly less.

Because of the perfection of instruments, the encouraging papers of Gallemaerts[6, 7], the brothers Green[8, 9],

Van Lint [10, 11], Nugent [12], Fisher[13, 14], Vila Coro[15], and the formidable statistics published by Barraquer [16, 17], Saint Martin[18], Cruickshank[19], Gilbert Cadilhac[20], Wolfe[21], and others, I again became interested in the suction method, and studied the cases operated on during the last two years at the Chicago Eye, Ear, Nose, and Throat Hospital by Fisher, following the technique of Smith; by Nugent, operating by the technique of Barraquer, and my own cases, operated on by the methods of Barraquer and with forceps. This comparative study of the three methods, the Barraquer, Smith, and forceps, is the material for this paper. I am addressing the results of my observations to those who, initiated in the field of ophthalmology, are lost among the diversity of ideas in which this important problem of cataract extraction is submerged. I shall describe briefly the advantages and inconveniences of the classical extraction in order to have a basis of comparison to analyze the intracapsular procedure.

Extracapsular extraction

In the classical extraction the anterior capsule of the lens is torn with special instruments and the cataractous contents are removed by expression. In cataract with completely sclerosed nucleus, occupying the whole interior of the capsular sac, the classical method will give excellent results, but this is not so true in the case of immature, Morgagnian, and soft cataracts, where a large quantity of cortical material is left in the posterior chamber, irritating the iris with its toxic products, and causing many other inflammatory complications, namely, posterior synechiæ which deform the pupil, seclusio pupillæ, occlusio pupillæ by organized pseudomembranes, both giving origin to secondary glaucoma. Besides these inflammatory complications, which require the systematic use of atropine after each operation for their prevention, there is danger of incarceration of the capsule in the incision, and the development of secondary cataracts by proliferation of lens epithelium, folding of the capsule or the organization and opacification of cortical remnants.

The manipulations necessary to express the cortical remnants left in the anterior chamber, traumatize the eye, and, at the same time, may produce a loss of vitreous, increase the reaction of the eye, and prolong the postoperative course. Though the use of irrigators helps to remove the cortical remnants left in the anterior chamber without traumatizing the eye, they do not succeed in extracting the transparent portions of cortex adherent to the capsule in the cases of immature cataract. These pieces of transparent cortex left with the capsule in the eye are responsible for many secondary cataracts, and contra-indicate the extracapsular procedures when the cataract is not ripe.

The subsequent interventions, such as discission, capsulotomy, and iridocapsulotomy, which have to be performed to establish vision in those patients who have had the misfortune of having a secondary cataract develop, are attended with the inconveniences of a new operation, with all its dangers. The extracapsular operation has in its favor that it is a universal method, applicable to all cases; that the posterior capsule remaining in its anatomic position, protects the vitreous, avoiding its loss better than the intracapsular methods, and that hernias of the iris are less frequent. Nevertheless, leaving in the eye a part of the organ which has lost its normal function, constitutes an incomplete operation. This has been understood by numerous ophthalmologists and for many years past we find operators who viewed intracapsular extraction as the ideal method, and the operation of the future.

Intracapsular extraction

After Daviel[22], in 1757 extracted a few cataracts with the help of forceps, the real era of the extraction in toto began with Richter[23], in 1773. Numerous other ophthalmologists, Arnemann[24] (1799), McNamara[25] (1871), Terson[26] (1872), DeWecker[27] (1875), the brothers Pagenstecher[28, 29, 30] (1871, 1877, 1888), Wright[31] (1884), Jacobson[32] (1889), Molroney[33] (1894),

Gradenigo[34] (1895), Stoewer[35] (1902), Smith[36] (1905), Kuhnt[37] (1908), and more recently, Pes[38] (1909), Kalt[39] (1910), Hulen[40] (1910), Stanculeanu[41, 42] (1911, 1912), Knapp[43] (1914), Török[44] (1916), Verhoeff[45] (1916), Barraquer[1] (1917), and Elschnig[46, 47] (1924, 1928), have improved the technique to such an extent that the statistics published in the last few years surpass by far those obtained with the capsulotomy methods. The increasing popularity of the intracapsular operation as the ideal surgical method is suggested by the enthusiasm now manifested for it.

The three fundamental intracapsular methods actually practiced, are the Smith, the forceps, and the Barraquer extraction.

Smith's intracapsular extraction

The Smith is the method of pure expression. The extraction is performed by applying external pressure which deforms the vitreous, and tends to empty the ocular contents in the only possible direction namely, towards the pupillary aperture and operative incision. In this method the resistance is represented by the lens and zonular fibers, the active element of the extraction being the vitreous body, deformed by the external pressure, which pushes the lens from behind, breaking the zonular fibers, first, and continuing until the lens has traversed the pupil and operative incision.

It is easily understood that in this method in which the vitreous plays such an active rôle, loss of this fluid must be very frequent, following the expulsion of the lens or before the extraction; besides, the younger the patient the more the danger of having this complication happen, as in such it is more difficult to break the zonular fibers. Due to the strong attachment of these fibers in the ciliary region, postoperative cyclitis, hemorrhages into the vitreous body, detachment of the choroid and retina, and intraocular displacements which predispose to incarceration of the iris, are to be expected. It is manifest how great the experience of the operator should be in order to obtain good results by this method.

To avoid the two principal inconveniences of extraction by the method of Smith, the loss of vitreous and incarceration of the iris, two other techniques have been devised which have the advantages of this method without its inconveniences. These two methods are extraction with forceps and the Barraquer.

Intracapsular cataract extraction with forceps

With the forceps the anterior capsule of the lens is grasped and, after performing a few movements in order to break the zonular fibers, the cataract is extracted, exerting a slight traction toward the exterior through which the eye does not experience more violence than that used in overcoming the resistance offered by the zonular fibers.

In this method the resistance is represented by the capsular attachments to the zonular fibers, and of these to the ciliary processes. This resistance is overcome only by the force of traction, leaving, therefore, the vitreous body intact. If any of this is lost it will be due to the inexperience of the operator, to unexpected movements of the patients, or to pathologic states of the vitreous, as for instance, adhesions between this fluid and the posterior capsule.

In the forceps method, the following special conditions have great influence: age of patient, type of cataract, model of forceps, and experience of the operator.

The age of the patients has an influence in the same way as in the Smith extraction, it being much more difficult to dislocate the lens in young patients. In these the rule is that the resistance of the zonular fibers is greater than the resistance of the capsule and the latter breaks; but if the capsule is more resistant than the zonular fibers we are subject to the complications already mentioned, of the ciliary body, choroid, and retina.

Relative to the type of cataract, we find that all capsules are not easily folded; therefore, in many cases, one

would be unable to use the forceps on account of the impossibility of grasping the capsule, as in some ripe cataracts, intumescent and sclerosed cataracts in which the nucleus fills the capsular sac completely.

The model of forceps is also of great importance. The primitive model of Kalt with sharp edges, has a tendency to cut the capsule; others allow an excessive opening of the branches, and fold such a large piece of capsule that the tension over the cataractous contents breaks the capsule. When the portion of the capsule grasped is very small, there is also danger of rupturing, because of not having sufficient amount on which to exert traction.

The Verhoeff forceps[48], in my judgment, is best suited for intracapsular extraction because of the following characteristics: By means of a stop the forceps open only to the proper distance, about 2.5 mm. This stop also acts in such a way, when the forceps is closed, as to limit the amount of pinching pressure to which the capsule can be subjected. In other words, with this modification, the only delicacy of manipulation required in grasping the capsule is in making backward pressure upon the lens. The grasping surfaces are flat, instead of sharp edged as in the primitive model of Kalt, which cut the capsule. The blades of the new forceps can come in contact only at the biting ends and at the heels, a space being left between these points which, in case of simple extraction, renders it impossible for the iris to be caught. The place where they must be held with the fingers is sufficiently wide and corrugated, making manipulation of them very simple.

It is easy to understand that operative experience plays a very important rôle, and for this reason statistics obtained with this method are very different, depending upon the operators, it being necessary that they have a large experience in the use of forceps to grasp a fold without rupturing the capsule or having the disagreeable complication of dislocating the lens into the vitreous body.

The Barraquer suction intracapsular cataract extraction

The erisiphake is essentially: (1) a pneumatic forceps of constant action, perfectly controlled, which on being applied to the anterior surface of the lens in a sufficiently large surface, permits the performance of the same movements as with the forceps, to dislocate and extract the lens. With the erisiphake the type of cataract does not have any influence as it can be used in the intumescent, ripe, and Morgagnian cataracts, as well as in the sclerosed type of large nucleus. (2) It is an instrument perfectly controlled, with which it is possible to obtain a constant suction, not being subject to the individual conditions of the operator. (3) It is not necessary to make either slight or excessive pressure to grasp the capsule as with the forceps. Thus by applying the erisiphake lightly on the anterior surface of the lens and establishing the suction current, the lens will remain adherent to the spoon or sucker in a lighter way than with the forceps, and allow the operator to make the manipulations necessary to dislocate the lens by breaking the zonular fibers. The theory that the Barraquer method dislocates the lens due to the vibratory vacuum is incorrect. To prove this statement, it suffices to perform a few operations on the eyes of kittens six weeks old, applying the erisiphake lightly on the anterior surface of the lens, opening and closing the valve, but without making lateral movements. We shall observe that the zonular fibers have not been broken. The same experiment can be performed in patients, and it will be observed that in those cataracts with capsules which fold easily, and with fragile zonular fibers, as usually found in patients over fifty-five years of age, the lens dislocates easily, due to the concentric diminution of the anterior capsule (Vila Coro)[48], which is drawn into the spoon of the sucker; but in those lenses with a large sclerosed nucleus, intumescent cataracts, and in the juvenile, the rapid action of suction with the erisiphake is not alone sufficient to break the zonular fibers, it being necessary for the

operator to perform the same motions which must be made when the forceps is used, in order to dislocate the lens (Cruickshank)[19*].

The foregoing proves that the Barraquer is in reality nothing else than a perfected forceps method, which permits the obtaining of a greater number of extractions in toto, than with the ordinary forceps. The vacuum of not over 60 cc. is not sufficiently high to produce ciliary traumatism, this complication being the result of having to finish the operation by the intracapsular method in cases in which the zonula does not break as at first intended. The sensitiveness of touch is conserved, as when the forceps is used, it being easily noticed if the zonula breaks or remains intact as happens in the cases of young patients with very resistant fibers.

Before studying practically the intracapsular methods, it will be necessary to mention some details which contributed greatly to the success or development of the cataract operation in general, and the intracapsular in particular.

Analyzing the statistics of different operators, it is observed that the results obtained are in direct relation to the technique used, the more care in details of safety in the technique, the better the results.

All authors have mentioned the difficulty of performing the intracapsular operation in nervous or unruly patients. This inconvenience has actually disappeared, with the systematic use of: (1) sedatives the day before operation; (b) paresis of the orbicularis muscle after the technique of Van Lint[49] (1914), or one of its modifications (Villard[50], 1919, O'Brien[51], 1930); (c) retrobulbar injection of novocaine and adrenalin; (d) fixation suture of the superior rectus.

The systematic use of these four precautions eliminates the necessity of active cooperation of the patient, previously necessary, and the operation is made with a complete immobility of the eye. The constant nervousness under which the operator had to work in the presence of these unruly patients also disappears.

The danger of loss of vitreous to which patients are naturally more exposed in operations in which the capsular wall which protects that fluid is removed, has given rise to classifying eyes (Green[9, 52] 1917, Dorland Smith[53], 1923) into those favorable to the intracapsular operation, being those not particularly liable to loss of vitreous, and into those in which the intracapsular operation is contraindicated, in which loss of vitreous, prolapse of the iris and expulsive hemorrhage are to be expected. To the first group belong eyes generally sunken into the orbit, called cadaveric eyes, in which the cornea collapses after the incision is completed. To the second group belong prominent eyes, generally found in plethoric patients, in which, when the incision is completed, horizontal striations appear in the cornea and the ocular contents tend to come out, half opening the lips of the incision.

The systematic application of retrobulbar injection is made so that all eyes can be included in the first group. A few minutes after the injection, a diminution of the intraocular tension is produced, which makes it possible to operate by the intracapsular method. The corneal incision with all its inconveniences of retarded healing, poor vascularization, tendency to iris prolapse, small incision, and so forth, has been replaced by the more rational incision in the limbus, with conjunctival flap. In the same way, the peripheral iridectomy and the iridotomy at the root of the iris, of Elschnig have been substituted for the large iridectomy formerly used. This has all the advantages of the latter and none of the inconveniences.

The corneal and conjunctival suture

In a recent trip to Mexico, where this paper was read, I was asked to demonstrate the intracapsular extraction with the method of Barraquer, and being unable to use the Barraquer machine, I extracted a few cataracts with the Sorenson vacuum pump, with no complications, exactly the same as I would have done with the Barraquer; there being no difference between the two pumps other than the manner of their construction. Therefore, for the Barraquer method, any kind of instrument can be used, provided it gives from 55 to 60 cc. of vacuum.

have come to fill an empty space in ophthalmologic surgery, helping the immediate closure of the incision, and reducing the chance of loss of vitreous, and improving the prognosis in cases in which it does occur, shortening the time of cicatrization, diminishing the prolapse of iris, infection, and most of the unfortunate postoperative sequelæ. Finally, the performance of a good incision has been extraordinarily facilitated by the use of forceps like that of Elschnig, which not only grasps the conjunctiva, but also the episcleral tissue, and gives an excellent fixation of the eyeball.

We shall now pass to the practical study of the different methods, the object of this paper.

Practical study of intracapsular methods

Method of Smith. Since Smith popularized the operation which carries his name, many have been the inconveniences attributed to it; as for instance, that it is an excessively traumatizing operation, which produces very violent tractions and subsequent complications in the ciliary body, choroid, and retina; that its corneal incision is difficult to close; that there is an excessive frequency of vitreous loss, deviations of the pupil upwards, and incarcerations of the iris; that it is contraindicated in congenital, juvenile, and secondary cataracts, in patients with prominent eyes, in traumatic cataracts and in glaucomatous eyes.

Many modifications have been introduced in the Smith technique, to avoid its principal inconveniences. Fisher[54] of Chicago, has been one of the principal advocates of this technique in North America, and has defended the method with much enthusiasm.

Fisher uses, systematically, euphthalmine and cocaine to dilate the pupil, and to widen the pathway of the lens; paresis of the orbicularis; suture of the superior rectus; a special lid retractor to separate the lids from the eyeball; incision with conjunctival flap, and preliminary conjunctival suture; extraction by Smith's expression method, helping the lens to be removed in difficult cases with his model needle, with this maneuver diminishing the loss of vitreous; peripheral iridectomy after tying the conjunctival suture; and eserine after the operation. Although the systematic use of all these details has considerably improved the statistics, obtained in the beginning with the primitive operation of Smith, the three principal inconveniences of this operation, which still remain, are the excessive pressure on the eye, which deforms it and produces an unnecessarily high number of deviations of the pupil upward; loss of vitreous; and incarceration of the iris. Therefore this technique is used only in those places where the condition of the patient or location necessitates its use, and by those operators who, having an experience of many years in this method, would be apt by any change in technique to obtain inferior statistics.

Intracapsular extraction with forceps

Kalt[39] (1910) was the first, who, by using his toothless forceps to draw out a piece of the anterior capsule of the lens, obtained extractions in toto, but it was Stanculeanu[41] (1911) who systematically began to extract the cataract in its capsule, using forceps devised by him. Since then many operators have introduced variations in the technique, primarily described by Stanculeanu, and many improvements in instruments.

The difficulty of folding the capsule has been partially overcome by making a slight external counterpressure on the inferior limbus with the help of a spatula or special forceps such as the Nugent forceps[55] or the hook of Arruga.[56] This maneuver increases the number of capsules which can be grasped and diminishes the danger of dislocation of the lens posteriorly into the vitreous body (Lancaster[57] 1916).

The principal inconvenience of extraction with forceps was the large number of capsules that ruptured. This has been corrected partially by the use of better forceps than the old Kalt model, and the application of pressure as in the Smith technique to the inferior part of the cornea or limbus.

With this combined method which we might call the Smith-Kalt, the principal inconvenience of the Smith operation, which was excessive pressure, and the large number of ruptures of the capsule in the extraction by forceps, have disappeared. We may consider as an exemplification of this method the one actually practiced by Elschnig[58] who regularly uses the following technique: Palpebral akinesia; retrobulbar injection with novocaine and adrenalin; fixation suture of the superior rectus; previous suture of the conjunctiva; incision with conjunctival flap, having the eyeball fixed with his model forceps; iridotomy at the root of the iris; extraction of the lens by the combined method of traction and external pressure. He grasps the capsule with his forceps (modification of Kalt's forceps), and at the same time applies pressure with the hook against the cornea, on a level with the lower edge of the dilated pupil. The lens is removed with tumbling, so that the inferior border is the first to pass through the incision; after the conjunctival suture is tied, the operation is finished with the application of a 5 percent solution of iodine in the incision and ointment of eserine.

Using the technique just described, there have been obtained in recent years, statistics with surprising results, and showing a very small average of ruptured capsules. In the statistics published by Safar[59] in 1929, he obtained an average of only 8 percent, but the rule is that the average operator with this method obtains from 20 to 30 percent of ruptured capsules. Sinclair[60], 24 percent, 1925; Verhoeff[61], 20 percent, 1927; Hörven[62], 42 percent, 1929; Poyales [63], 38 percent, 1928; Basterra[64], 32 percent, 1929; Manes[65], 26 percent, 1930; Elschnig[58], 24 percent, 1929; Castroviejo[5], 30 percent, 1929. Elschnig[66] in his report of the last eight hundred and nine cases operated on with the forceps shows 20 percent of ruptured capsules.

Intracapsular method of Barraquer

Since Barraquer, in 1917, presented his method of extraction, many practical inconveniences have been attributed to this procedure; as, for instance, the frequent loss of vitreous (Elschnig[58], Moore[67]); that it is a dangerous method to use in unruly subjects (McAndrews[68]); that it produces changes in the vitreous, even after the most successful operations (Peters[69]); that scientifically it is an incorrect method (Russel Smith[70]); technically poor (Kubik[71]), and requires expensive instruments.

Early statistics for this method show a percentage of complications higher than with the forceps or capsulotomy methods, being due more to unexpected movements of the patients, or the inexperience of the operators, than to the method itself. But, operating with the eye perfectly immobile, loss of vitreous, suction of the iris, and so forth, which are the complications mentioned, have now disappeared, and the application of the erisiphake on the anterior surface of the lens when the pupil is dilated is as easy or easier than grasping the capsule with the forceps for the average surgeon.

The statistics of Barraquer[16, 17], Saint Martin[18], Gilbert Cadilhac[20], Wolfe[21], and others prove that the visual results are as good as those obtained with forceps, the complications no more numerous, and that ruptured capsule practically does not occur.

Study of the vitreous body in patients operated on by the Barraquer method, shows that this fluid does not undergo any pathologic change without postoperative complications of inflammatory origin (Muñoz Urra[72], Saint Martin[18,73], Gilbert Cadilhac[20], Cruickshank[19].

The changes observed in the vitreous are generally due to hemorrhages in the anterior chamber during, or after the operation (Cruickshank[19]), or to pathologic states which existed before the surgical procedure was instituted.

In the early stages of the development of this method, the instrumental armamentarium was not perfected, and in some cases during the most important steps of the operation, the instrument would not function. With the modern instruments we never have to interrupt the operation, because of this.

Some authors still state that this method is scientifically incorrect, and technically poor, but the number of intracapsular extractions obtained with it is greater than in the best statistics by the method of forceps. This can be easily proven by comparing the statistics published in 1929, by Safar with those published by Barraquer, Saint Martin, Gilbert Cadilhac, Wolfe, and many others, and the complications are not greater than by the other methods.

The high cost of the instrument, though it may be an obstacle for the specialist with a very small practice, should not be so for those whose practice is larger.

We have to remember the enormous advantages obtained in diagnosis and treatment with instruments of very high cost, as the corneal microscope, Gullstrand ophthalmoscope, phototherapy lamps, and many other instruments now used by all advanced ophthalmologists.

Barraquer technique[74]. Dilatation of the pupil with euphthalmine-cocaine ointment starting two hours before the operation; palpebral akinesia, retrobulbar injection of novocaine and adrenalin; conjunctival flap, and previous conjunctival suture; the conjunctival flap is made in such a way that round the whole periphery of the cornea a small narrow rim of conjunctiva is left except above, where the flap is prolonged for approximately 4 or 5 millimeters; peripheral iridectomy; extraction with the erisiphake, with tumbling of the lens, using pressure as in the Smith technique only in the beginning of the extraction, and in some cases when the traction alone exposes the capsule to rupture as happens in cataracts with fragile capsules (sclerosed cataracts with large nuclei). The conjunctival flap suture is tied and supplementary sutures applied.

Barraquer considers the method contraindicated in young patients, generally those under fifty-five years of age, in traumatic, subluxated, membraneous, and complicated cataracts with posterior synechiæ, and in glaucomatous eyes.

Author's technique

The technic which we personally use, deviates very little from that used by Elschnig and Barraquer.

After having made a detailed study of the patient's general condition, eliminating foci of infection and trying by all means to bring the patient to operation in a normal general condition or as nearly so as possible, the day before the operation he is given a dose of bromides or veronal, and another dose the day when the surgical procedure will be undertaken.

The pupil is dilated two hours before the operation with euphthalmine and cocaine, after the formula of Barraquer, or with the subconjunctival injection of a few drops of cocaine and adrenalin (Saint Martin[75]), in cases of sluggish pupil; systematically the palpebral paresis of Van Lint is used; retrobulbar injection of novocaine and adrenalin; fixation suture of the superior rectus; the eyelids are separated by the speculum of Arruga[76], which does not make any pressure on the eyeball; the eyeball is fixed with Elschnig forceps, and the incision is made with a conjunctival flap, a narrow rim of conjunctiva being left around the periphery of the cornea, to serve later for complementary sutures and to make a perfect closure of the incision. A central suture is placed in the conjunctiva. Two peripheral iridotomies following the technique of Elschnig, are performed at about "10 and 2 o'clock." The extraction is performed with Verhoeff's forceps and external counterpressure as recommended by Lancaster[57,77], or with the pneumatic forceps of Barraquer (erisiphake), in which case external counterpressure is only necessary when the path of the lens through the pupil is difficult. We do not make the lens tumble, as we do not find any advantage in this maneuver. The conjunctival suture is tied and more sutures are inserted in order to get a perfect closure of the incision; generally one on each side of the central suture serves this purpose, but sometimes five sutures are required; eserine ointment is applied and a central palpebral suture when necessary. The patient re-

mains in bed the first day; the second day he can sit up and the binocular bandage is changed; the palpebral suture is removed and the unoperated eye is uncovered; if the patient does not experience any discomfort the operated eye is not observed until the fourth day after the operation, when it is dressed, and if in good condition, the patient may leave the hospital about the seventh day after the operation has been performed.

As we have no means to indicate the state of the zonular fibers before the operation, we always make an attempt to extract the lens intracapsularly, abandoning it in cases of very resistant zonular fibers, in which case we finish the operation by the classical method after a very wide circular capsulotomy, followed by the application of toothed forceps in order to remove any pieces of torn capsule. The two peripheral iridotomies have eliminated entirely the possibilities of the iris becoming herniated, which previously was almost the only complication published in our cases of intracapsular extraction.

In some cases the extraction began with forceps, but because of the impossibility of grasping the capsule, the operation was finished by the Barraquer method. We have never had the opposite condition occur, which convinces us of the superiority of the latter method over the former.

The results obtained in our patients are similar to those obtained by other operators with forceps and Barraquer methods. We generally have from 20 to 30 percent of ruptured capsules, when the forceps is used, and less than 10 percent when using the Barraquer method. The visual results are exactly the same in both methods for the intracapsular extractions. We never found changes in the vitreous body after operations performed normally.

Summary

Theoretically and practically, the operation of Smith is inferior to those of Elschnig and Barraquer, owing to its greater number of complications, especially loss of vitreous, deviation of the pupil upwards, and incarceration of the iris.

The forceps method as it is performed by Elschnig is a very rational operation, which unites the advantages of both the Smith and the forceps methods, without their inconveniences and requires a very simple instrumental equipment; it has no other inconveniences except that it gives a number of ruptured capsules, which varies between 20 and 30 percent.

The Barraquer is theoretically and practically the best and most perfect of the intracapsular operations, because it gives as good visual results as the combined method of Elschnig and has no more complications. It has, on the contrary, the advantages that it rarely ruptures capsules. The only drawback to the method is the cost of the instrument.

The development of intracapsular operations and their actual use without exposing patients to serious complications, has been due to the systematic application of all the complementary details to assure a perfect immobility of the patient, to facilitate the surgical moment and to effect a convalescence without accidents.

As the intracapsular methods are not applicable to juvenile and traumatic cataracts, with posterior synechia, and other complications, the classical method is necessary in these cases.

The ideal would be that all ophthalmologists adopting an eclectic criterion would master the different methods so as to change from one to the other when necessary. It will finally be manifest that my criterion agrees in every point with the statement made by Ellett in 1930, (quoted by MacAndrew in Archives of Ophthalmology, March, 1930) in reviewing the points of the last Congress of Ophthalmology celebrated in Amsterdam in 1929, that is: "The trend in cataract operation was rather definitely indicated and in the light of this congress one might speak of the 'modern cataract operation' as being an extraction in the capsule with a peripheral iridectomy, and suture of the conjuntival flap". The Smith operation was not mentioned.

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ADENOCARCINOMA OF THE LACRIMAL GLAND

With case report

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In the case reported here a recurrent neoplasm of the orbit was known to be present twenty-five years before the death of the patient from postoperative meningitis. Microscopically all the tissue studied was pure adenocarcinoma but the protracted history of the case suggests that the original tumor may have been of mixed type as are the great majority of such tumors previously reported in the literature. From the Department of Pathology of the University of Michigan.

Any type of new growth of the lacrimal gland is rare and carcinomas make up but a very small percentage of all lacrimal growths reported. In fact there are those, notably Greeves[1], who believe that all tumors of the lacrimal gland are of the mixed type, and that carcinoma does not occur. For this reason the following case is particularly interesting.

Case report. Mr. J. D., 41 years old, a married farmer of Austrian birth, first noticed a forward displacement of the right eyeball in 1905. The proptosis slowly increased until 1914, when, because of the displacement, the right eyeball was removed. Following this the patient was in good health except that he soon noticed a painless growth within the right orbit. This mass slowly grew larger until early in 1921 when the rate of growth was much accelerated, and the tumor began to involve both upper and lower lids.

When he was first seen in the Department of Ophthalmology at the University Hospital (Michigan), in July, 1921, examination revealed marked swelling involving both lids of the right eye, extending up to the brow and down almost to the ala of the nose. It extended forward 34 mm. (by exophthalmometer). The tumor was somewhat brawny to palpation, elastic, and composed mainly of four lobes. The conjunctivæ were reddened and discharged a mucopurulent exudate. Vision in the left eye was 5/5-1. The remainder of the examination was negative (Fig. 1).

A clinical diagnosis of tumor of the orbit, probably sarcomatous, was made. An exenteration of the right orbit was performed under general anesthesia, and a large tumor mass removed. The floor of the orbit had been eroded somewhat, opening into the antrum, and a mucous discharge presented when the tumor was removed. The orbit was left clean, and a radical antrum and ethmoid operation was done at this time, because of the mucocele. The patient had an uneventful convalescence.

Fig. 1 (Freyberg). Profile view of the patient at the time of his first appearance at the University Hospital in 1921.

The material removed from the orbit and antrum was fixed in formol, sectioned, and stained in hematoxylin and eosin. The greater part of the tissue was found to be neoplastic. The new growth was not enclosed within a capsule, but was infiltrating muscle and fat

tissue, and the loose areolar tissue of the orbit. Throughout, the neoplastic tissue was made up of the same type of cells, which were of polyhedral shape and 40 to 60 microns in diameter. The finely granular cytoplasm took a light bluish-pink color with hematoxylin and eosin. Each cell had an approximately centrally placed, oval, blue staining nucleus, 10 to 14 microns in diameter, with a prominent nucleolus. These cells

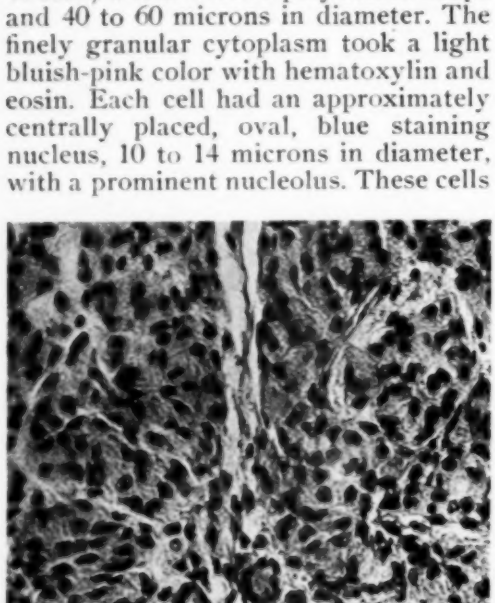

Fig. 2 (Freyberg). A photomicrograph showing the character of the neoplasm removed at the exenteration of the right orbit in 1921. A medullary adenocarcinoma.

had all the characteristics of epithelial cells.

In the more dense portions of the tumor the neoplastic cells were closely packed into a firm medullary mass, but in the portion of the material where the natural growth characteristics had not been distorted by pressure, the cells were seen to be grouped in an alveolar arrangement, although no actual acini with central lumina were formed. Clefts separated these alveolar nests of cells (Fig. 2). There was no evidence of neoplastic fibrous tissue, or of any type of supporting tissue neoplasm (myxoma, chondroma, osteoma). The tumor was not, therefore, a mixed tumor in the literal sense, but a true carcinoma. The absence of cornification, epithelial pearls, and other characteristics of squamous epithelium, the direct resemblance of the individual cells to glandular epithelium and the alveolar architecture, required that it be classified adenocarcinoma. Its location and resemblance to the lacrimal gland tissue, justified the diagnosis made at the time—"medullary adenocarcinoma arising from the lacrimal gland."

After the exenteration, the patient returned to the clinic several times, for examination of the orbit and surrounding tissues. In June, 1922, eleven months after the operation, the orbital cavity was well covered with epithelium, except for an opening into the antrum and nose. All the tissue appeared healthy. There was no suggestion of recurrence. In March, 1923, there was still no evidence of recurrence.

The patient was not seen again until January, 1930, when he returned complaining of a growth in the right orbit. Examination showed the lower lid to be infiltrated with a large nodular mass "resembling two hickory nuts". The surface was bleeding and crusted. The upper lid was similarly infiltrated with a large, dense, hard, and rather tender, nodular tumor. A sinus extended from the upper lid down into the orbit temporally, next to the bone, through tissue showing secondary infection. Examination and x-ray studies revealed destruction of the antral roof, as well as the floor of the frontal sinus on the involved side, and sinusitis of the maxillary, frontal, and ethmoid sinuses of that side. Accordingly, a second exenteration of the right orbit and of the nasal accessory sinuses involved, was performed. The superior wall of the orbit was found to be perforated by the tumor which extended into the frontal lobe of the brain and appeared to invade the optic canal. On the first day after the operation, the patient developed pyrexia and signs of menin-

gitis, and died the following morning.

At autopsy it was found that there was complete destruction of the right orbit, the roof being absent and the brain exposed in an area measuring 3½ by 4 cm. There was traumatic hemorrhagic softening in the frontal lobe in apposition to the right orbit, and an acute purulent exacerbation of a subacute leptomeningitis. Meningitis was the immediate cause of death. Neoplastic tissue was found extending along the right optic nerve and the pituitary gland was displaced to the left by a mass of the neoplastic tissue, pyramidal in shape, occupying the position of the right cavernous sinus. The capsule of the pituitary was invaded on the right by the neoplasm (Fig. 3). No distant metastases were found.

Microscopic study of the tissue removed at the second exenteration and that removed at autopsy showed the neoplasm to have the same appearance as in 1921, except that there was slightly less marked alveolar architecture. So the same pathologic diagnosis was given the neoplasm from each of these sources, namely, adenocarcinoma.

The pathological diagnoses made from the autopsy were: Recurrent carcinoma (malignant adenoma of lacrimal gland) of right orbit. (Enucleation of right eye 16 years previously.) Death, postoperative. (Exenteration of right orbit with craniotomy). Acute purulent exacerbation of subacute leptomeningitis. Traumatic hemorrhagic encephalitis. Extension of neoplasm throughout right cavernous sinus and capsule of pituitary body. Acute purulent bronchitis and bronchopneumonia. Aortic atherosclerosis. Nephropathia arteriosclerotica. Old tuberculosis of both apices and bronchial nodes. Atrophy and chronic passive congestion of all organs.

In summary, this history is that of a neoplasm of the right orbit, known to have existed twenty-five years before death of the patient. Nine years after the clinical onset of the tumor, the displaced eyeball was removed. Soon after there was noticed in the right orbit a tumor mass, which increased in size slowly for seven years, when suddenly it began to grow rapidly. Accordingly, sixteen years after the original onset, an exenteration of the right orbit and involved nasal sinuses was done. Recurrence followed this, and a second exenteration was done, twenty-five years after the tumor was first known to be present. Two days later the patient died of meningitis.

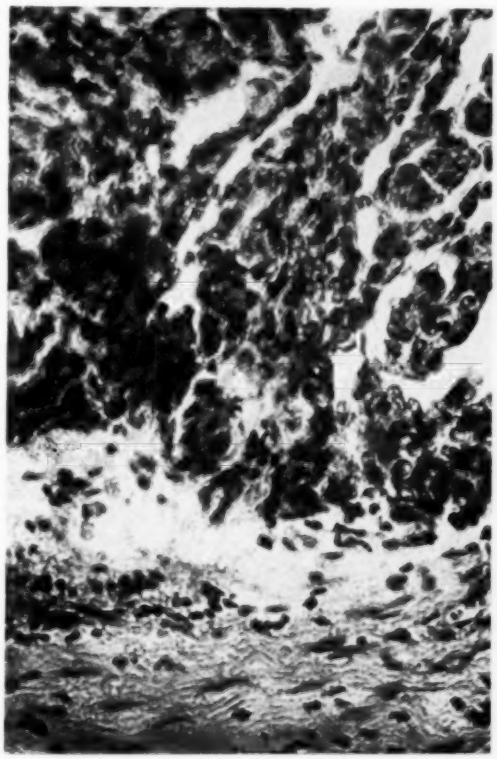

Fig. 3 (Freyberg). A photomicrograph showing invasion of the capsule of the pituitary gland by the orbital adenocarcinoma as found at autopsy.

Comment

It was in 1598 that the first lacrimal gland tumor was reported by Fabricius Hildanus[2]. Through the following years isolated cases were reported. In 1901, Warthin[3] published the first review of the literature and analysis of the 132 cases he found reported. The next review was made in 1922 by Lane[4] who reported 112 additional cases. Each of these authors found that by far the majority of all lacrimal gland tumors were composed of a mixture of different

kinds of tissue—epithelial, fibrous, myxomatous, and often also cartilaginous—exactly similar to the mixed tumors of the parotid and other salivary glands. So these lacrimal gland neoplasms were grouped with the salivary gland tumors under such terms as myxochondroma endotheliale, fibromyxochondroma, and myxochondroendothelioma, a group now more simply termed mixed tumors of salivary gland type.

Since 1922 there have been eighteen lacrimal gland tumors reported in the literature. These have been diagnosed as follows:

Type of tumor	Number reported
Adenoma	1
Adenocarcinoma	7
Cancer	2
Carcinoma	1
Cylindroma	1
Epithelioma	1
Fibroma	1
Lymphoblastoma (lymphoma)	1
Mixed tumor	3
Total	18

Of the 262 neoplasms of the lacrimal gland reported to date (not including this case), 45, or 17 percent are designated by names which would now be considered to mean a form of malignant epithelial neoplasm (such as cancer, carcinoma, adenocarcinoma). But many so classified by early observers were not studied microscopically. With such study many would doubtless have been found to be mixed tumors. Moreover, there has always been, and still is, some confusion and doubt as to the epithelial or endothelial histogenesis of the prevailing cells in certain of the mixed tumors of the salivary gland type. In fact, the pathological descriptions of many of these tumors that were examined microscopically, are such that they would now be classed as mixed tumors. Thus it is found that true carcinomas of the lacrimal gland are exceedingly rare.

Of the forty-five lacrimal gland carcinomas reported, thirteen have been styled adenocarcinoma. However, from a study of these it is found that a number were so diagnosed upon insufficient grounds. Only ten were described as to their microscopic appearance. A review of these cases follows:

In the latter part of the last century, Knapp[5] reported two new growths of the lacrimal gland. One was made up of hypertrophied lobules of glandular tissue, cysts, areolar cancer, and myxomatous tissue. This he called myxoadenoma carcinomatosum. The other showed a large accumulation of epithelial cells, some connective tissue cords; but in some places plain adenoma structure. This tumor he called adenoma carcinomatosum. Belt[6], in 1906, described a growth which consisted of tissue of mixed types, connective tissue and epithelium. This he called adenocarcinoma but others considered it a mixed tumor. In 1916, Holloway[7] reported a neoplasm which was primarily an epithelial neoplasm, growing for the most part as an adenocarcinoma, with squamous cells, epithelial pearls, and large areas of mucinous substance in the fibrous stroma of the growth. In places there was myxomatous and cartilaginous tissue. Although he called this an adenocarcinoma he spoke of it as an example of the so-called mixed tumors.

A tumor reported by Francis[8] in 1924, was found by accident in a young girl 18 years old who was being prepared for prothesis. From his description this growth seems to have been a true adenocarcinoma. There were no photomicrographs presented. He described several lobes of acinous gland structure separated by connective tissue septa corresponding to lacrimal gland tissue. In the surrounding tissue there were hyperplastic ducts and solid plugs of epithelial cells similar to the duct cells.

In 1930, Benedict and Broders[9] reported five cases of neoplasm of the lacrimal gland, giving excellent pathological descriptions and photomicrographs. Each of these growths was composed of a mixture of different types of tissue: epithelial, fibrous, myxomatous, and (in four) cartilaginous. Each was diagnosed as "adenocarcinoma, of the type of so-called mixed tumor". They called attention to

the polymorphism of the epithelial cells in this type of tumor.

From the descriptions of the authors, it is seen that all these neoplasms reported as adenocarcinoma (except that described by Francis) are really mixed tumors, since they are made up of a mixture of tissue types, both epithelium and supporting tissue, (fibrous, myxomatous and cartilaginous). Most were classed as adenocarcinoma because of the predominance of epithelial tissue, the alveolar arrangement, and the tendency toward malignancy. None was made up wholly of epithelial tissue. It is in this respect that the tumor herein reported, and that of Francis, are distinctly different from the others diagnosed as adenocarcinoma.

It has been recognized by all that the mixed tumors of the lacrimal gland (just as those of the salivary gland) are of low grade malignancy and are important only regionally; at least, in the earlier stages of their growth. If wholly removed they should not recur; but if allowed to recur repeatedly, they may be expected to take on a heightened degree of malignancy as do the similar new-growths of the salivary glands. The lacrimal gland tumor forming the subject of this report behaved clinically in accordance with the type, for the history extended over a period of twenty-five years, the tumor was operated on three times, and the immediate cause of death was not the tumor, but the result of local destruction and extensive operation in an attempt to remove all of the neoplastic tissue. At autopsy the neoplasm was found to extend only regionally; there were no distant metastases. One concludes, then, that this adenocarcinoma was of a very low grade of malignancy, behaving clincally much as do the "mixed tumors". The best interpretation of this adenocarcinoma is that it was originally a neoplasm of this type, in which the epithelial elements outgrew and eventually replaced all other component types. If so, on the occasion of the first microscopical examination, nine years before the death of the patient, all evidence of other than true adenocarcinomatous structure had disappeared. It may be that the first operative procedure, done elsewhere, and from which no tissue was examined microscopically, removed neoplastic structures that would have revealed mixed tumor characteristics. Proof that this neoplasm was other than a true adenocarcinoma rests only on clinical evidence, as its microscopical character has shown no deviation from that type.

Summary

1. A recurrent neoplasm of the right orbit is known to have been present twenty-five years, in the course of which time an enucleation of the displaced eyeball and two exenterations of the right orbit were performed, nine, sixteen, and twenty-five years, respectively, after the tumor was first noticed.

2. The character of all the neoplastic tissue available for microscopical study, extending over a period of nine years, is that of a pure adenocarcinoma.

3. From an analysis of the literature concerning tumors of the lacrimal gland, and the protracted history of this case, it is suggested that this adenocarcinoma may have originated in a mixed tumor of the salivary gland type, by the epithelial elements overgrowing the supporting tissue components.

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THE CHEMICAL CONSTITUTION OF THE CORNEA

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The proportions of the various chemical constituents of the cornea have been determined and are given in this paper. From the Wilmer Ophthalmological Institute of the Johns Hopkins University and Hospital.

Before biochemical syntheses of the complex metabolic and pathological processes of the cornea may be further elaborated, a more complete analytical study of the tissue must be made. This communication gives the results of an investigation of the chemical constitution of the cornea.

The chemistry of the cornea has been more completely studied than that of the sclera. The oldest reports pertaining to the chemistry of the cornea may be disregarded as they are interesting only historically and not scientifically. Michel and Wagner[1] found 72.25 percent water and 0.66 percent ash in the substantia propria of the cornea, 72.11 percent water, 0.74 percent ash, and 8 to 12.3 percent soluble protein in the epithelium. Mörner[2] calculated by analysis from the nitrogen 82.2 percent collagen and 17.8 percent mucoid, and from the sulphur 81.2 percent collagen and 18.8 percent mucoid. His[3] obtained 24.12 percent dry substance, 20.38 percent mucoid, 0.95 percent ash in the cornea, and 24.48 percent dry substance and 1.15 percent ash in the epithelium.

Method

Materials. Fresh ox corneas were excised within the limbal margin immediately after slaughter of the animal. The sections were made perpendicular to the surface of the cornea. Abnormal eyes were rejected.

Water. Corneas were quickly removed from the eye, lightly blotted with ash- and fat-free absorbent filter paper to remove adherent moisture and weighed in stoppered weighing bottles. The corneas were dried at 105°C. to constant weight. They were not comminuted or washed with water because of the impossibility of preventing loss or gain in the amount of water. The average percentage of water in nine samples weighing about 10 grams each was 81.127 percent; minimum 80.342 percent and maximum 81.856 percent.

Inorganic matter (ash). The incineration of the above samples was done in platinum crucibles in an electric muffle at about 500°C. until all the carbon was burned and the ash came to a constant weight. The average percentage of inorganic matter in the above nine samples was 0.872 percent; minimum 0.798 percent and maximum 0.943. percent.

Fat (ether soluble lipids). Corneas after drying were comminuted and dried at 105°C. to a constant weight. About 8 grams of dried cornea were extracted in a Soxhlet apparatus with anhydrous ether until lipids were no longer obtainable. The average percentage of fat in eight samples was 0.224 percent; minimum 0.175 percent and maximum 0.434 percent.

Epithelium, endothelium, Descemet's membrane, and substantia propria. After a careful excision of the cornea perpendicular to the surface and just within the limbal margin, the epithelium and endothelium were completely removed. Descemet's membrane was then separated from the substantia propria.

If there were any doubt of the complete removal of the membrane or of the adherence of the substantia propria to the membrane all portions of the cornea were discarded. The dissections were made rapidly in a room practically saturated with moisture. The tissues were kept in ground-glass-stoppered weighing bottles to prevent loss of water.

The separate tissues were dried at 105°C. to a constant weight. From 50 to 100 corneas were used for each of nine samples of the tissues. The results for the analyses of the weight of solids are given in the following table:

Table I

Percentage of Constituents of the Cornea

constituent	average	maximum	minimum
epithelium	10.024	10.237	9.645
endothelium	0.915	1.111	0.860
Descemet's membrane	1.117	1.345	0.987
substantia propria	84.944	89.104	86.278

Albumin and globulin. Freshly prepared corneas were finely ground by machine. The corneal tissue mixed with the tissue fluid from the ground corneas was extracted with 10 cc. of distilled water per gram of cornea by continual stirring at 4°C. for about two hours. About 100 grams of wet tissue were used for each determination. The aqueous extract was removed by centrifugalization. The extraction was repeated until soluble proteins were no longer obtained. The extract was then heated to give a temperature increase of about 1°C. in 10 minutes, to coagulate the soluble proteins. Coagula were obtained at 53-56°C. and 61-65°C. for globulin and 71-73°C. for albumin. Sodium chloride extracts gave similar coagula. A very slight nebulosity occurred with various concentrations of acetic acid indicating practically no solution of mucoprotein. The coagula were washed with water, alcohol, and ether and dried at 105°C. to constant weight. The average percentage of albumin and globulin was 0.772 percent in four samples.

Water-soluble extractives and undetermined substances. After the albumin and globulin were coagulated, the solution was filtered and evaporated to dryness and dried at 105°C. to constant weight. The average percentage of extractives of the four samples was 0.684 percent.

Corneal mucoid. The water soluble proteins and extractives were removed from freshly prepared substantia propria. The tissue was extracted by stirring at 4°C. with 10 cc. of half-saturated lime water per gram of substantia propria for 24 hours[4]. The suspension of tissue was removed by centrifugalization. To the solution was added one percent acetic acid until a maximum precipitation of the mucoid occurred upon standing. The substantia propria was repeatedly extracted until mucoid was no longer obtained. The mucoid, after it was separated from the solution, was redissolved in half-saturated lime water and reprecipitated with acetic acid. It was then washed with cold distilled water until the wash water gave no test for calcium, then was extracted with alcohol and ether, and to avoid decomposition was dried in a vacuum over sulphuric acid to constant weight. The average percentage of mucoid in ten samples of substantia propria weighing about 100 to 150 grams each was 13.838 percent; minimum 12.887 percent and maximum 14.452 percent.

Corneal collagen (gelatin). The above mucoid free substantia propria was washed with cold water distilled four times and then with 0.1 percent acetic acid until no test for calcium was given by the wash water. The substantia propria was then washed until the water of extraction showed a pH above 6.9. It was mixed with distilled water and heated to 95°C. for six hours. Then it was centrifuged off and repeatedly extracted with water in the same manner until practically no test was obtained for gelatin. The gelatin solution was concentrated by evaporation until it was viscous. After prolonged centrifugalization to remove any fine suspension, the supernatant liquid was poured slowly with stirring into a large amount of 95 percent cold alcohol. The fibrous gelatin was removed by centrifugalization. It was redissolved in

hot water, then dried and reduced to a fine powder. The gelatin was estimated by difference. One direct estimation was 99.0 percent as compared with the indirect method.

Corneal elastin. The insoluble residue remaining after the extraction of the gelatin was an albuminoid which may be called elastin. If any reticulin was present it was hydrolyzed and appeared as gelatin. The residue was extracted with alcohol and ether, dried and ground to a light brown powder. The average percentage of elastin in 10 samples was 2.355 percent; minimum 2.027 percent and maximum 2.714 percent.

Discussion

The difficulties of analyses of the chemical constitution of the cornea are too numerous to be discussed in detail, and only the chief ones are to be mentioned. Animal tissue cannot be kept chemically unchanged even if it is frozen. The initial chemical preparations must be begun as soon as the animal is killed, because the enzymatic decomposition starts at once. Small thin pieces of tissue, such as Descemet's membrane, dry rapidly, and easily give an abnormally high solid content unless they are prepared in moist air. The amount of fat in corneas varied with the solvent and chemical treatment of the tissue. Ether was used because it is a standard fat solvent in tissue analysis. Although the epithelium contains albumin and globulin in relatively large quantities no attempt was made to estimate the water-soluble coagulable proteins, nor to determine the fat, ash, and the water-soluble extractives in epithelium, endothelium, and Descemet's membrane, since these tissues occur in quantities too small to be easily analyzed at the present time.

The results may be summarized in the following composite tables:

Table II

CHEMICAL COMPOSITION OF THE CORNEA

constituent	tissue		
	fresh percent	dry percent	substantia propria percent
water	81.127		
solids	18.873		
epithelium	1.8918	10.024	
endothelium	0.1828	0.915	
Descemet's membrane	0.2009	1.117	
substantia propria	16.5975	87.944	
mucoid*	2.6029	13.838	15.73
collagen (gelatin)*	13.5478	71.751	81.59
elastin*	0.4468	2.355	2.68

* Mucoid, collagen, and elastin were determined in substantia propria from which the water soluble proteins and water soluble extractives were extracted.

Table III

EXTRACTIVES OF THE CORNEA

constituent	tissue	
	fresh percent	dry percent
water	81.127	
solids	18.873	
inorganic matter (ash)	0.165	0.872
organic matter	18.708	99.138
proteins	18.537	98.220
water insoluble (collagen, etc.)	18.391	97.448
water soluble (globulin and albumin)	0.146	0.772
extractives (water soluble)	0.129	0.684
fat (ether soluble matter)	0.042	0.224

The material was obtained through the courtesy of Mr. R. L. Fox. Mr. Warren Tauber kindly gave his assistance in many of the analyses.

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GLIOMA EXOPHYTUM

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A case of retinoblastoma, or glioma of the retina is described. The defect in the eye was first noticed at the age of six years. Diagnosis was delayed because the tumor was not visible in its location behind the detached retina. Enucleation was performed and the patient remained free from signs of recurrence at the last reported examination one year later. Read before the Brooklyn Ophthalmological Society, February 16, 1931, and before the meeting of the American College of Surgeons, at Brooklyn, October 14, 1931.

There are three varieties of glioma classified as to origin and location of the tumor and the direction of growth.

The first type is glioma exophytum or tuberosum. The case reported in this paper falls under this classification. This tumor has its origin on the outer surface of the retina. Several small nodules appear and spread out between the retina and choroid in the subretinal space causing early detachment of the retina. By confluence they form a tuberous deposit on the outer surface of the retina.

The second type is called glioma diffusum or planum. The detached retina is thickened in its entire extent. The deposits remain comparatively thin and level and later by proliferation the surface becomes uneven and protuberant.

The third type, glioma endophytum, is the kind usually seen and is three times as frequent as the exophytum. In this third group, the neoplasm arises from the inner layers of the retina, and grows into the vitreous, but the retina usually remains attached to the choroid. The vitreous surface of the growth is lobulated, cauliflower like, or nodular. This is the type usually referred to when the term, glioma of the retina, is used.

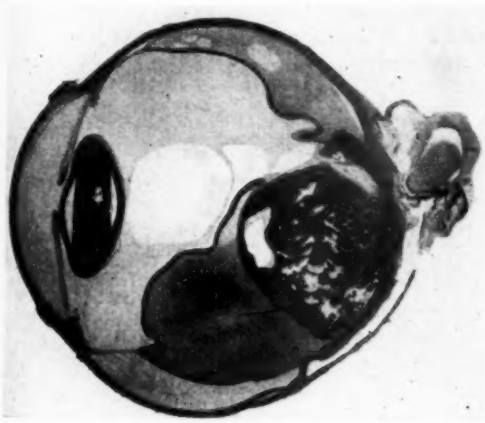

Fig. 1 (Cutino). A case of Dr. Rogers demonstrating a typical glioma endophytum.

Several years ago there was some discussion as to the proper name for glioma of the retina. Flexner called it neuroepithelioma and Verhoeff called it retinoblastoma. In 1926 the American Ophthalmological Society accepted the name retinoblastoma as suggested by Verhoeff.

Glioma of the retina is to be differentiated from many eye conditions which may simulate it. An error in diagnosis is possible in two directions, a tumor may be present and diagnosed as something else or a diagnosis of glioma may be made in an eyeball which on microscopical examination is found to be otherwise afflicted. Some of the conditions which may confuse the diagnosis are exudative choroiditis, metastatic choroiditis, organized exudate in the vitreous, tuberculoma of the choroid, gumma, detachment of the retina, sarcoma of the choroid, cysticercus, and Coate's exudative retinitis. Coate's disease occurs even in young children and is characterized by an organized exudate between the choroid and the retina, appearing like large woolly patches, with later detachment of the retina and secondary glaucoma—a history very much like that of tumor. Another very rare disease which may appear like glioma is Von Hippel's disease which is featured by angiomatous masses in the retina with repeated hemorrhages and finally retinal detachment and glaucoma.

The case here reported is of a boy, aged six years, of German descent, who was admitted to the clinic on July 14, 1930. The mother stated that she had noticed the left eye turning in for the past month. He had had tonsillitis and whooping cough at four years of age but no other illness.

Examination of the eyes revealed a left convergent strabismus; vision of the right eye was 20/25; vision of the left eye 2/200. The right eye showed no pathologic condition in the cornea, media, or fundus.

The left eye findings were as follows: the cornea and media were clear, with normally colored reflex from the pupil. The fundus showed a large detachment of the retina of six diopters elevation extending from the disc upward to the periphery. Markedly dilated, convoluted, and branching vessels were seen running over the retina in this area. Below the disc there were two small circumscribed white woolly patches. In one of these patches a blood vessel entered at the superior margin and emerged from the other side. The tension of the left eye was normal. The slitlamp showed no deposits on the posterior surface of the cornea. The Lang transilluminator did not cast a shadow in any direction.

The clinical examination included medical, neurological, and nose and throat consultations, all of which were negative. The urine, blood Wassermann, intradermal tuberculin test, and x-ray of the orbit were all negative. Blood cell count and differential were normal.

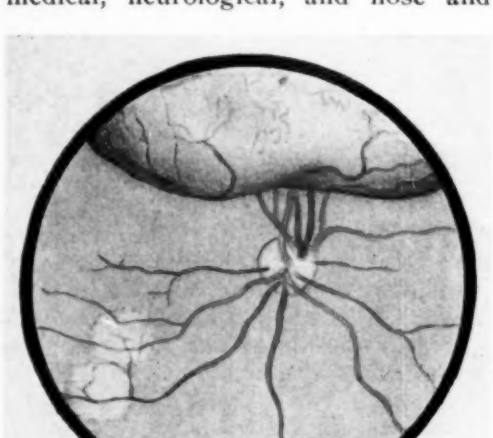

Fig. 2 (Cutino). View of fundus July, 1930.

Because of the unusual fundus picture, most of the clinic staff saw the case and the consensus of opinion was that before deciding on enucleation, it was best to watch the progress of the retinal lesions because of the normal tension, presence of some vision, the absence of shadow on transillumination, and because of the resemblance of the patches in the lower part of the eye to Coate's exudative retinitis.

For the next month the fundus did not reveal any considerable change. The patient was then not seen for two months, until October 28, 1930. By that time marked changes had taken place. The vision of the left eye was reduced to light perception only, although the tension was still normal. The two small patches below the disc had disappeared and instead there were three large areas of detachment extending to the periphery and fusing into one. Transillumination was positive for a shadow above. Enucleation was advised and performed on October 29, 1930. The microscopic diagnosis of the specimen was "glioma exophytum, without involvement of the optic nerve".

The patient was last seen on February 15, 1931*, at which time the socket was clean without edema or induration. The vision of the right eye was 20/25, visual fields normal, and careful fundus examination with mydriasis revealed no lesion.

When the patient was first examined, this was thought to be a case of Coate's disease. The error in diagnosis was due to the generally accepted idea that glioma very rarely occurs in children over four years of age, and to the fact that most of us expect a glioma to appear only as a growth into the vitreous, while this tumor was flattened out between the retina and the choroid de-

* Patient has been examined at regular intervals since and on October 10, 1931, there was no involvement of socket, brain or fundus of right eye.

taching the retina very early. The transparency of the tissues was another misleading sign but the saving feature of our experience with this case was the application of the old rule that an eye without vision and with doubtful diagnosis, cannot be allowed to remain in the orbit.

We might mention the fact that this case teaches the importance of recognizing a higher age limit for glioma cases were of patients under four years old except seven which were scattered between the ages of four and seven years. Here and there in the literature are found cases of patients as old as sixteen years so the occasional occurrence of a case with age over seven years cannot be disputed.

The most careful diagnosticians have erred in the diagnosis of glioma. As an example is cited a series of twenty-four

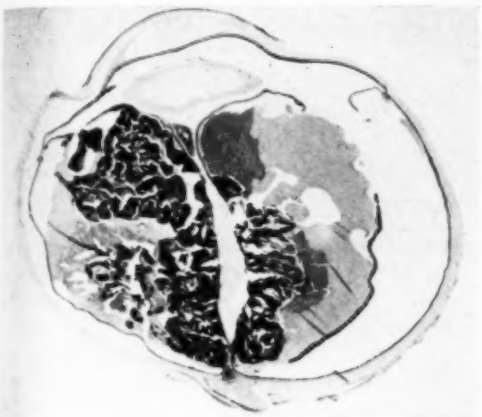

Fig. 3 (Cutino). Low power view of glioma exophytum.

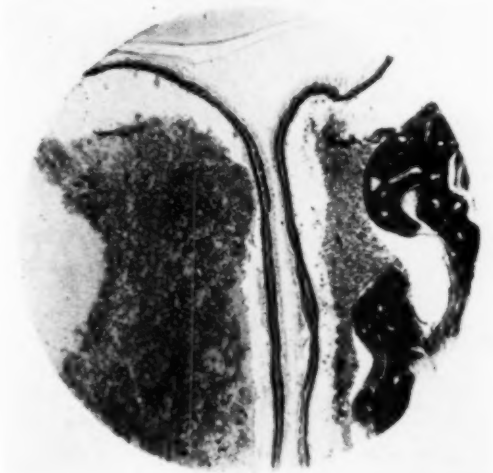

Fig. 4 (Cutino). High power view showing retina in good condition with tumor growing into subretinal space.

and the existence of more than one type. Many of us have a preconceived idea that glioma grows into the vitreous where it is easily seen and recognized because of the typical yellow-white reflex from the pupil known as "Beer's amaurotic cat's eye". As a matter of fact, the tumor growing between the choroid and retina does not give this reflex but early causes detachment of the retina and thus obscures the picture, as in this case.

Glioma is such a rare disease that we feel we may be excused for making an error in diagnosis as the records of the Royal London Ophthalmic Hospital show a total of 163 cases in 53 years, or about three cases a year. All of these eyes removed at the Royal Ophthalmic Hospital of London with the diagnosis of glioma, of which seven were incorrectly diagnosed. Very often eyes that have been removed with this diagnosis, have turned out to be eyes with remains of the hyaloid artery or of the posterior vascular sheath of the lens. But blind eyes with these congenital anomalies are of no service to the owners and are liable to degenerative processes later because there are usually associated with these errors of development, other serious defects, such as congenital hydrophthalmus.

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THE HYALOID MEMBRANE OF THE VITREOUS

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Anatomical and histological evidence is offered that a hyaloid membrane exists in human and animal eyes, attached to the pars plana of the ciliary body, and separating the aqueous from the vitreous chamber. From the Department of Ophthalmology of the University of Pennsylvania. Read before the American Academy of Ophthalmology and Otolaryngology, September 17, 1931.

In a paper by one of us (A. C.) published in this Journal 1932, v. 15, p. 124, a membrane was described that was seen by slitlamp examination after intracapsular cataract extraction. This membrane was found in all uncomplicated cases examined and it was seen at the earliest time after operation that slitlamp examination could be made. At first the membrane had a bulging anterior surface, but later it occupied a vertical plane just posterior to the iris and separated the aqueous from the vitreous chamber. At that time the opinion was advanced that this structure was not a newly formed structure, a postoperative formation or a condensation surface of the vitreous, but a membrane that existed in the normal eye.

The present contribution offers anatomical and histological evidence that such a membrane is present in both human and animal eyes. The work

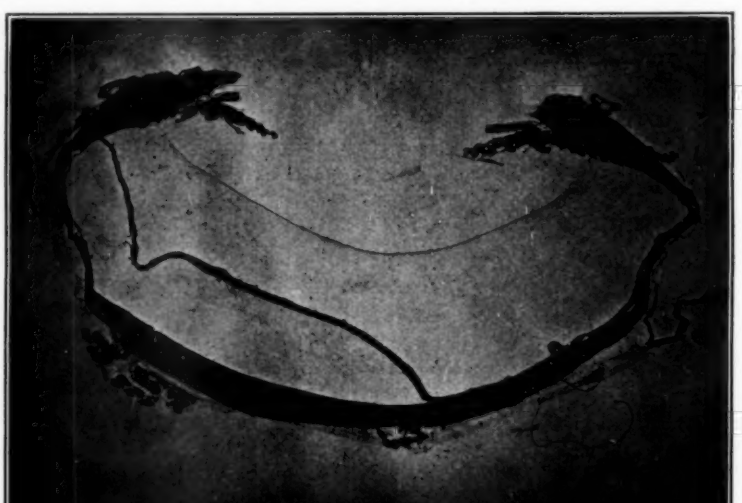

Fig. 1 (Cowan and Fry). Section through a pig eye with the cornea and iris removed, and the lens extracted in its capsule, showing the hyaloid membrane of the vitreous stained with Verhoeff's elastic tissue stain.

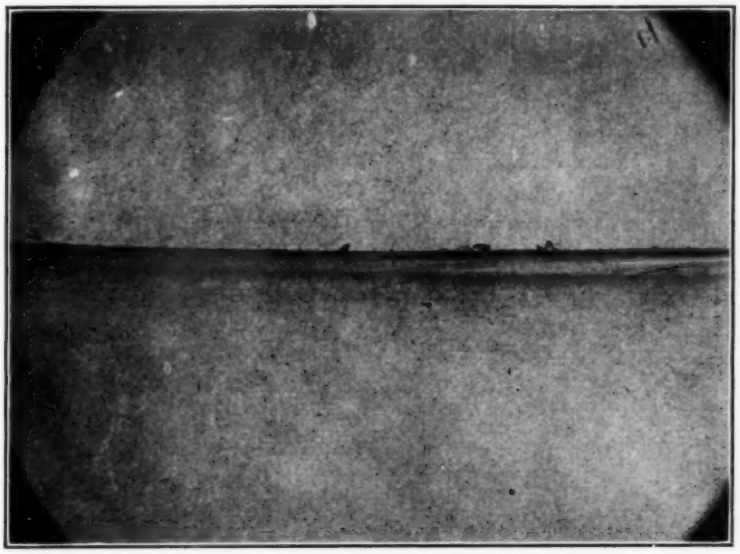

Fig. 2 (Cowan and Fry). The hyaloid membrane of the vitreous of the same eye as in figure 1 seen under higher magnification.

was done on pig, monkey, kangaroo, and human eyes. Two types of preparation are presented, the first gross and the second microscopic. In the first type, which was carried out on pig, monkey, and kangaroo eyes, after fixation in 10 percent formalin, and further hardening in alcohol, the whole cornea was removed at the limbus and the iris cut off at its base. The anterior portion of the suspensory ligament of the lens was severed and the lens extracted in its capsule. Then the posterior portion of the sclera with the retina was cut away at a point about 1 mm. behind the position of the ora serrata. Next, under a dissecting microscope and high illumination, the vitreous was carefully removed. This left a membrane-like structure having its attachment in the pars plana of the ciliary body and which had completely separated the aqueous from the vitreous chamber.

In preparations of the second type, which were carried out on pig and human eyes, the cornea, iris, and lens were removed as noted above. The specimen was examined by slitlamp, then dehydrated, embedded in celloidin and microscopic sections prepared. After this, sections were stained with the purpose of demonstrating a membrane which, from previous clinical examination and from the above gross anatomical preparations, we believed was present. The following stains were used: hematoxylin and eosin, Van Gieson, Mallory's anilin blue, fuchsin, phosphomolybdic-acid hematoxylin, Unna's orcein, Verhoeff's and Weigert's elastic tissue stain. Of these a freshly prepared solution of Verhoeff's elastic tissue stain gave the best results.

The following four specimens of this type are presented, two of pig eyes and two of human eyes.

Specimen I, pig eye (Figs. 1 and 2). After preparation as noted above, slitlamp examination showed a smooth, mirror-like surface that had the contour of the posterior surface of the lens. Behind this was a narrow opaque zone, and behind the zone a space of varying width which was optically clear except for a small number of fiber-like structures; posterior to this the vitreous structure was seen. Microscopic examination showed a structure of definite thickness that stained faintly with hematoxylin and eosin, but took a deep blue with Verhoeff's elastic tissue stain. The membrane extended from the position of the anterior portion of the pars plana ciliaris of

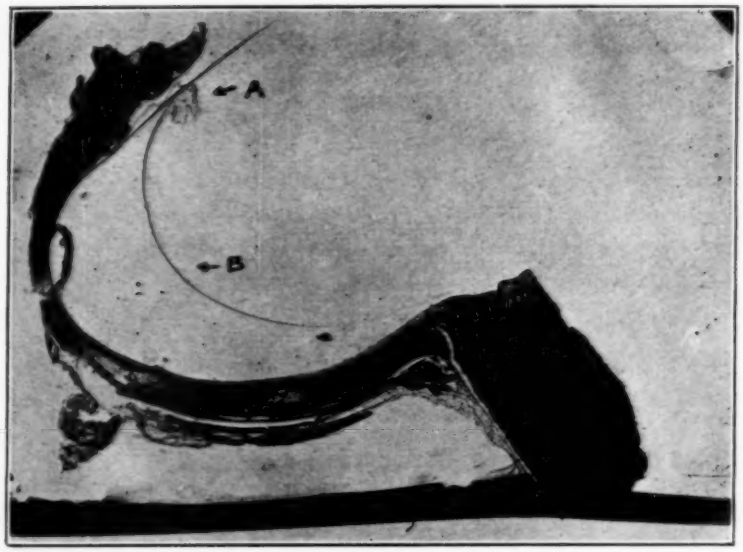

Fig. 3 (Cowan and Fry). Section of a pig eye cut to show the hyaloid membrane at A, and the sagittally cut edge of the vitreous at B.

one side to a corresponding position on the other side. All examined sections of an eye cut in serial sections showed this structure intact. A section of the lens showed the capsule intact.

Specimen II, pig eye (Figs. 3, 4, 5 and 6). The eye was prepared as in specimen I, and dehydrated through alcohols to absolute alcohol. The eye was cut anteroposteriorly, placed in absolute alcohol and ether, and then embedded in celloidin. Sections were cut in such a way as to show the membrane and cut edge of the vitreous in

Fig. 4 (Cowan and Fry). Higher magnification of the same eye as in figure 3, showing the hyaloid membrane at A, and the sagittally cut edge of the vitreous at B.

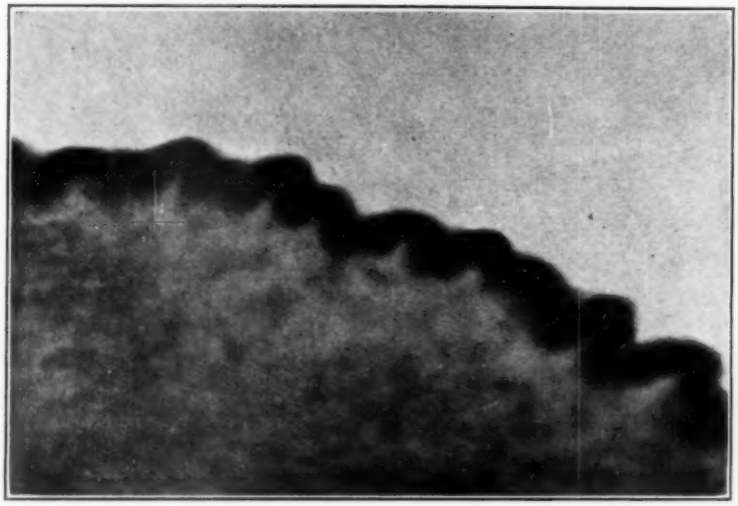

Fig. 5 (Cowan and Fry). The hyaloid membrane of the vitreous seen under high magnification.

one section. This section showed a slightly wavy and wrinkled membrane extending forward and inward from a position slightly anterior to the ora serrata. The membrane ended sharply, and the faint edge of the cut vitreous extended posteriorly to the position of the optic disc. A section of the lens showed the capsule intact.

Specimen III, human eye (Figs. 7 and 8). Preparation was completed as in specimen I. The slitlamp examination showed a smooth, even surface, with a curve corresponding to the posterior surface of the lens. Behind this was an opaque zone of irregular thickness, on the posterior portion of which were a number of irregular deposits. The vitreous was fluid and contained floating granular opacities. The microscopic section showed a deep blue structure, extending from ciliary body to ciliary body, and slightly thicker at the periphery than in the center. The vitreous was granular. There was, however, no microscopic evidence of

Fig. 6 (Cowan and Fry). The sagittally cut edge of the vitreous seen under the same magnification as in figure 5.

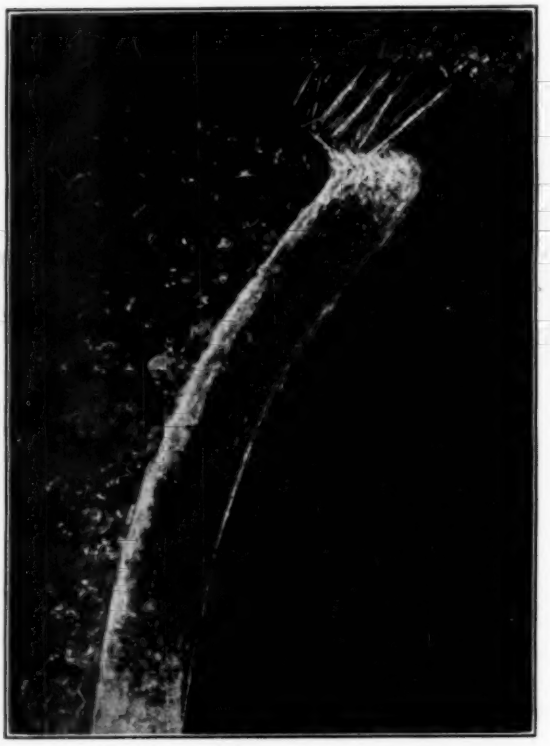

Fig. 7 (Cowan and Fry). Drawing of the slitlamp appearance of the hyaloid membrane of the vitreous seen in a human eye after removal of the cornea and iris, and the lens in its capsule.

cyclitis. A section of the lens showed the lens capsule intact.

Specimen IV, human eye, prepared and examined as in specimen III. In this specimen a folded and wavy membrane extended from ciliary body to ciliary body, and stained deep blue with Verhoeff's elastic tissue stain.

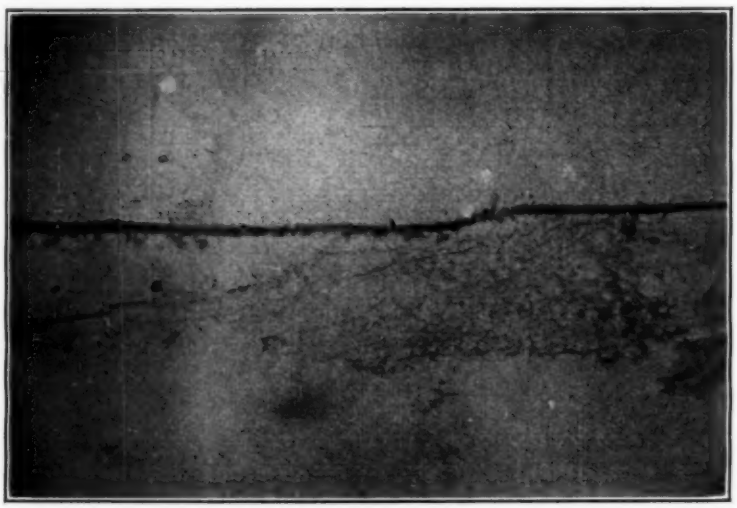

Fig. 8 (Cowan and Fry). Microscopic section of the hyaloid membrane of the vitreous of the same eye as in figure 7.

All of the eyes, with the exception of the two human eyes, in which a membrane was demonstrated, were normal and had been fixed shortly after enucleation. The first of the human eyes, specimen III, was from a case of exophthalmos with well marked exposure keratitis. The eye was obtained twelve hours after death, and immediately fixed. The vitreous in this case, as shown by slitlamp examination and by section of the fellow eye, was fluid. The other specimen was a normal human eye, obtained five days after death. This accounts for the marked granularity of the vitreous as seen in the histological preparation.

We believe that the evidence presented warrants the view that there is a non-nuclear, structureless, uniformly staining membrane that completely separates the aqueous from the vitreous chamber, is normally in contact with the posterior lens capsule, and which may be designated as the anterior hyaloid membrane of the vitreous.

NOTES, CASES, INSTRUMENTS

RECURRENT MELANOSARCOMA

CHARLES LUKENS, M.D., F.A.C.S.
TOLEDO, OHIO

Case I. Recurrence after thirteen years

Mrs. C. E. T., aged 38 years, consulted the writer August 15, 1915, complaining that for the past six months she had been unable to see very well with her right eye. The vision of her right eye was found to be 1/7 of normal, the left eye normal. Ophthalmoscopic examination revealed a detachment of the right retina, in and well forward. Since the detached area transmitted light perfectly, she was given the usual course of treatment for simple detachment, but after two months, the detachment being no better, a Graefe knife was plunged into the sclerotic, external to the detachment, evacuating a straw colored liquid. The detachment was temporarily improved, but four months later was worse than ever. She returned in February, 1918, two years later, the eye having been blind for six months. The retina was folded in from three sides, a shadow from transmitted light showing at the site of the first detachment. Schiøtz tonometer registered 55 mm. mercury. She was advised of probable tumor and its seriousness, but did not return until August 8, 1918, when the eye was stony hard, and a small dark spot was showing in the nasal sclerotic near the equator. The eyeball, with a long piece of nerve was enucleated. No other external manifestation of suspected tumor was visible.

When seen in 1919, 1925, and 1927, the socket was normal. She returned in May, 1931, complaining of smarting in the right cheek. She attributed this to a new, specially made glass eye, which she had obtained six weeks previously, and could not now wear. The socket was occupied by a bluish black mass, the size of a hickory nut, covered by conjunctiva. It moved with the other eye and had the appearance of a socket following an implant operation. There were no constitutional symptoms. The nose and accessory sinuses were apparently unaffected.

The orbit was exenterated June 4, 1931, preserving most of the skin of the eyelids and the periosteum. The tumor was encapsulated, being a dark blue spheroid, about 30 x 24 x 21 mm. Clinically it was diagnosed a melanosarcoma. Three bony walls of the orbit had been eroded by pressure; namely, most of the os planum of the ethmoid, a portion of the roof of the antrum about 10 x 15 mm. in extent, and the thin portion of the greater wing of the sphenoid, separating the orbit from the temporal fossa.

Dr. Theodore Zbinden, pathologist to Flower Hospital, examined both tumors and made the appended microphotographs. His description was as follows:

The first specimen (Fig. 1) consists of the eyeball which on section presents a dark brown tumor occupying about one-fourth

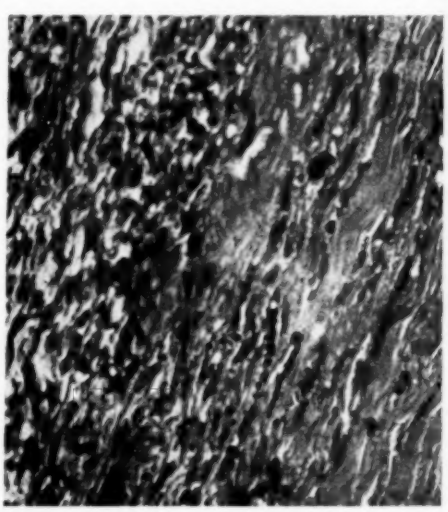

Fig. 1 (Lukens). Melanosarcoma of choroid; spindle cell type. (x360)

of the posterior chamber. The tumor is 4 to 6 mm. thick and is attached on the side of the eyeball extending to the ciliary body.

Microscopic examination reveals a spindle cell melanosarcoma attached to the sclera and lifting the retina from its attachment. Melanin is found in rather coarse

* Read before the Academy of Medicine of Toledo, Ohio, Oct. 30, 1931.

granules in the interspaces. The stroma is very scant, but contains numerous dilated blood vessels. The neoplasm is firmly attached to the sclera and penetrates slightly between the neighboring fibers.

The second specimen (Fig. 2) removed

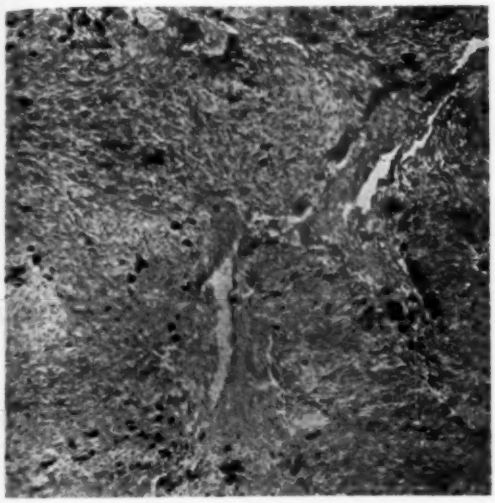

Fig. 2 (Lukens). Recurrent melanosarcoma of orbit after 13 years; spindle cell type. (x100)

13 years later is a somewhat spherical mass 3 cm. in diameter weighing 17 gms. It has a thin fibrous capsule and is quite soft. The cut surface here presents a somewhat striped dark brown appearance with some hemorrhagic areas.

Microscopic examination shows typical spindle cell melanosarcoma. The cells are of moderate size and contain some pale cytoplasm and rather large oval nuclei. Nuclei have delicate chromatin net work and generally contain one nucleolus. Mitotic figures are quite numerous. Stroma is scant, consisting mostly of dilated blood vessels. Pigment is arranged in clumps, mostly in the interspaces. Some of the tumor cells contain fine granules of pigment. This is a late recurrence of identical sarcoma of choroid removed 13 years ago.

Deep x-ray therapy was used, following the exenteration. The orbit is now practically covered with epithelium and is quiet.

Case 2. Recurrence after nine years

Miss B. had detachment of retina symptoms for six or eight months, acute glaucoma for three weeks, and Elliot trephine operation six days before I saw her. Examination was on May 12, 1922. The eye was blind, stony hard. There was evidence of recent operation. A fundus glare was obtained down and out and detachment of retina seen up and in. Enucleation was performed next day for suspected tumor. The socket healed promptly and remained well until last examined September 30, 1931.

On December 29, 1931, Dr. Louis Smead opened the abdomen of this patient and found the liver apparently filled with melanosarcoma. He took a small biopsy of liver and sewed up the abdomen.

Dr. Bernard Steinberg, pathologist to Toledo Hospital, reported:

The specimen measured 4 x 1.3 mm. The outer surface was gray-white in color with a few slightly elevated, black, rather circumscribed areas. The cross section of the tissue was light gray, homogeneous with similar elevated, circumscribed, black areas. The histologic picture of the tissue presented an alveolar arrangement of cells, polyhedral in type with large vesicular nuclei containing a single nucleolus. The cytoplasm was rather clear. In places there was both intracellular and extracellular dark brown granular pigment. With a silver stain the pigment appeared black, which is a staining characteristic of melanin. The diagnosis of a metastatic melanosarcoma (melanoma) was made.

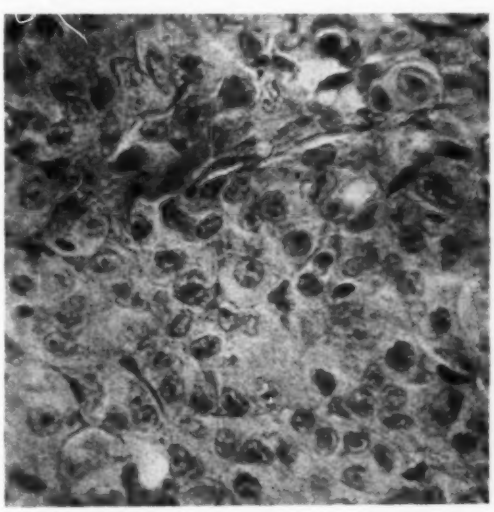

Fig. 3 (Lukens). Tumor nodule showing alveolar arrangement of polyhedral cells with fairly clear cytoplasm. Large vesicular nuclei containing single nucleoli.

Dr. Thos. L. Ramsey, pathologist to St. Vincent's Hospital, examined the

eye and supervised the microphotographs and reported as follows:

Tumor of the eye. Growth consists of a small elevated nodule about 1 cm. in diameter at the base, slightly cone shaped, extending into the posterior chamber. It lies adjacent to the optic disc and is apparently arising from the choroid.

Sections show the main mass of the tumor to be composed of small spindle cells closely packed and many showing mitotic figures. Some areas show marked pigmentation, which is apparently melanin, but the bulk of the mass is not pigmented. The retina is adherent over the growth and is infiltrated by tumor cells in many areas. It is quite changed in structure and exists only as a thin fibrous structure over the tip of the growth. The pigment epithelium shows proliferation around the base, and under the neoplasm it is seen growing into the tumor mass giving the mass a melanotic appearance. The tumor is quite vascular and shows no degenerative areas.

Diagnosis: Pigmented leucosarcoma of the choroid (Melanosarcoma).

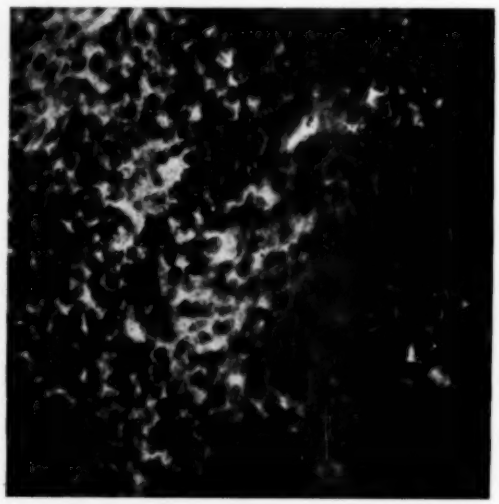

Fig. 4 (Lukens). Character of the pigmented and nonpigmented cells, several seen in mitosis. (x400)

Dr. G. R. Callender reported 111 cases from the Army Medical Museum before the American Academy of Ophthalmology and Otolaryngology, in 1931, remarking that there were four readily distinguished histologic types: "The spindle cell type, consisting of two sub-types; the epithelioid type; the fascicular type; and the mixed cell type".

"While the duration of observation is insufficient to allow definite conclusions to be drawn, there are no deaths reported from tumor in the spindle cell types, 35 cases; and between 25 and 30 percent case fatality rate for each of the other three types".

These two cases seem to show that the relatively good prognosis of the spindle cell type has its exception and that three to five years' freedom from a recurrent malignancy does not necessarily indicate a cure.

316 Michigan street.

MADDOX CHEIROSCOPE

H. Rommel Hildreth, M.D.
SAINT LOUIS

In the treatment of strabismus and amblyopia ex anopsia the stereoscopic principle has been applied in a variety of instruments. Recently this plan was

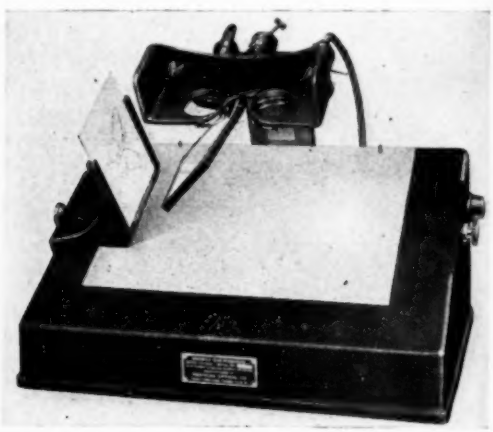

Fig. 1 (Hildreth). The cheiroscope set up for drawing exercises.

extended so as to bring the hand into service to educate the eye. The technique and instrument were developed by Dr. Ernest E. Maddox of England.

This stereoscope is so designed that the field of vision of the eye under training lies directly before the patient while the field of the other eye is separated and placed to one side. This is accomplished by the use of a tilted mirror that hangs between the lines of vision of the two eyes. The test object is then reflected from the side to the sound eye and is projected by the sec-

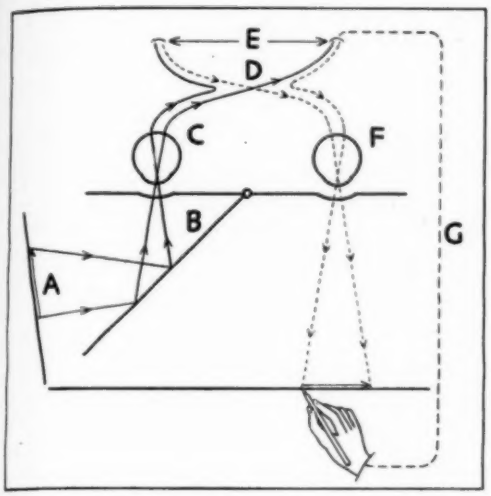

Fig. 2 (Hildreth). A—object. B—mirror. C—normal eye. D—chiasm. E—visual brain centers. F—amblyopic eye. G—impulse from motor brain centers to hand.

ond eye to the drawing-board where it is translated by tracing with the hand. The hand being directed by the eye under treatment arouses interest and coordination of the two eyes is effected by this effort of the hand. The cheiroscope combats the essentials of strabismus with amblyopia ex anopsia by: 1. restoring vision in the amblyopic eye; 2. linking together corresponding retinal points; 3. encouraging fusion.

The design of the campimeter feature of this instrument was contributed by Dr. Ralph I. Lloyd. The inclined mirror allows for stereoscopic fixation but removes the restriction in the nasal field present in the usual campimeters.

The manufacturer and distributor of this American model is the American Optical Company.

Reference

Maddox, Ernest E. A new ("eye and hand") method of training squints. Amer. Jour. Ophth., 1930, May, v. 13, pp. 379.

824 Metropolitan building.

SOCIETY PROCEEDINGS

Edited by Dr. H. Rommel Hildreth

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

November 10, 1931

Dr. J. W. Ramsay presiding

Retinal pigment striæ associated with exophthalmos

Dr. R. O. Rychener presented Mr. J. R. C., aged fifty-eight years, a public accountant who was operated on July, 1930, for toxic goitre with relief of all symptoms. Six months later, exophthalmos, which had not been present previously, appeared in both eyes. On February 17, 1931, the vision with myopic correcting lenses was 6/5 in each eye. There was loss of convergence; Graefe's sign and practically all other ocular signs associated with exophthalmic goitre were present. The measurement with the exophthalmometer was O.D. 17 mm., O.S. 18 mm. He was referred back to his internist, who reported the general examination, including basal metabolic rate, as normal, with the exception of hypertension, the blood pressure ranging from 160 to 200. The conjunctiva gradually became more cyanotic due to venous congestion, the exophthalmos increased, and the retinal veins became engorged, with some edema of the discs. In August the vision for the first time became subnormal and there was from that time on, an increasing failure of vision with increase of all signs and symptoms mentioned above, so that the vision October 26, fell to O.D. 2/60; O.S. 3/60, unimproved by glasses. The exophthalmometer reading was O.D. 26 mm., O.S. 27 mm., but the eyelids still completely covered the globes. However, in the following week his wife noticed that the corneas were slightly exposed in sleep and some corneal disturbance took place in spite of ointments and bandage. The blood pressure now ranged from 170 to 240, without any response to general treatment. The vascular changes of the retina were more pronounced, hemorrhages being apparent over the discs and along the course of the vessels, but the striking change was the appearance in the retina behind the retinal vessels of dark streaks apparently arising at the disc and running radially in all directions, but mainly through the macular region. These seemed to be in the pigment layer of the retina from their position and color and a fine pigment disturbance could be made out in association with them. These gave the impression of tension striæ of the retina as though the tissue were put on a stretch, and might be due to the pull on the optic nerve due to the long continued exophthalmos. The visual fields had been normal throughout the course of the disease and the fundus findings did not in themselves seem sufficient to account for the serious deterioration of vision. The treatment had consisted of mercury and iodide internally and mercury bichloride ointment with eyepads at night.

Discussion. Dr. E. C. Ellett agreed that the retinal pathology alone did not seem sufficient to account for the extreme failure of vision but was at a loss to understand what had taken place inasmuch as visual disturbance following toxic goitre was extremely rare.

Dr. P. M. Lewis suggested the necessity for tarsorraphy if the corneal exposure should continue.

Dr. R. O. Rychener, closing, stated that the corneal edema was a most recent complication and some surgical means to counteract it would be undertaken if the exposure persisted. He felt however that this was due more to the exposure from infrequent winking than to exposure during sleep. At the suggestion of Dr. Eustace Semmes, a novocain injection of the posterior sympathetic chain at the level of the first rib had been done in an effort to obtain Horner's syndrome with an accompany-

ing enophthalmus. This however proved unsuccessful.

He had previously seen one similar case in a negro whose left eye was markedly proptosed following a Halle operation for atrophic rhinitis. In this instance the sight was entirely lost and the only fundus findings were some gray striate lines in the retina traversing laterally from the disc through the macula.

Traumatic meningitis

Dr. M. B. Seligstein presented a report of a case of penetrating wound of the cribriform plate with meningitis. The patient had been admitted to the Baptist Hospital in semicomatose condition four days after falling out of a tree on to a stick of wood which penetrated the orbit just above the left eye. The wound was exposed to the bottom and a rubber drainage tube inserted. Hot, wet compresses followed the operation. Temperature returned to normal in ten days. On the fifteenth day a rise of temperature to 101° occurred and on the seventeenth day the patient died.

X-ray report had been negative. Smear showed gram positive cocci; culture, staphylococcus aureus hemolyticus.

Autopsy findings: Brain abscess; penetrating wound to medial side of left eye extending through the cribriform plate into the anterior fossa. A piece of wood three-quarter inches long and one-quarter inch thick was found lying on the cribriform plate.

Rat-bite fever from rat bite of eyelid

Dr. Phil M. Lewis reported the case of a colored female, aged fifteen years, first seen in the eye clinic of the University of Tennessee on September 18, 1931. She and her mother stated that three weeks previously while asleep, a rat bit her just below the right eye. The wound bled a little but healed and was apparently entirely well in two or three days. Three days before coming to the clinic, swelling of the lower lid began and a soreness developed at the point where the bite occurred. The child felt sick, the swelling increased and involved both lids so that she could not open her eye.

The right lids were very edematous, but could be opened with difficulty and disclosed a normal globe and slightly injected conjunctiva. There was a slight ulceration of the skin of the lower lid about 1 cm. below the lid border and just lateral to the midline. Beneath this wound or ulcer was an indurated mass which was quite tender. The preauricular gland on this side was definitely enlarged and tender. Temperature was 102° F. Puncture of the mass at the site of the wound was made and a small amount of clear serum obtained which was examined in a dark field preparation, but no organisms were found. The same procedure was repeated the following day, also a puncture and smear of fluid from the preauricular gland and a wet blood smear were made. No spirochetes nor other organism were found.

The patient was admitted to the medical service of the Memphis General Hospital. Blood cultures made on three successive days were all negative, as were tests for malaria, typhoid, undulant fever, and tularemia. Blood counts were all normal as was the urinalysis. She had an irregular fever for four days after admission, varying from 100° to 104° F. The edema and soreness gradually diminished and the fever subsided after the fourth day in the hospital. Hot compresses of magnesium sulphate were used locally. Two intravenous administrations of neoarsphenamine .3 gm. were given. The fever dropped and marked improvement was noticed after the first dose. She was discharged on September 27, 1931, after eight days in the hospital. At that time the edema and the glandular enlargement had almost entirely disappeared.

Comment: This was undoubtedly a case of rat-bite fever in spite of failure to demonstrate the spirochæta morsus muris. Swab (Amer. Jour. Ophth., 1930, v. 13, pp. 884-886) reported a similar case in which the organism was not found. A list of references was given after his article.

Tumor of the orbit

Dr. W. Likely Simpson reported the case of Mrs. W. L. W. who had given history of tumor of the right orbit for the last eighteen months. There had been a protrusion of the upper lid most of this time. The vision had been poor, especially for the last few months. The findings at the time of the first visit were: O.D. vision, fingers one foot. The eye protruded, especially the upper lid and there was practically no movement. A firm tumor mass could be felt below the eye extending from the outer to the inner canthus. A Krönlein operation was performed. The periosteum was slit anteroposteriorly and the growth was demonstrated over a large extent of the orbit, therefore the bone was replaced and the incision closed and a horizontal incision of the external canthus was made and the lids retracted and an exenteration of the orbit done. The growth seemed to extend entirely to the apex of the orbit. A specimen of the tissue from the apex of the orbit was taken for pathological study. Dr. Leake reported that the growth was malignant but he had made no classification.

R. O. Rychener,
Secretary

BALTIMORE CITY OPHTHALMOLOGICAL SOCIETY

October 22, 1931

Dr. Alan C. Woods, chairman

Lens extract; its preparation and clinical use

Dr. L. Burky gave a short review of the literature on the use of the extract, both for testing the sensitivity to lens protein and as a therapeutic measure.

The procedure for collecting and preparing the lens protein, more carefully than that previously followed, was described in detail, as was also the testing for sensitivity and the types of reaction usually seen.

It was interesting that in a number of patients examined, positive skin reactions were obtained only in those with cataracts.

The results of the use of lens extract in cataract cases, both before and after operation were given. In postoperative inflammations its use had been of definite value.

This paper has been published in the October, 1931, issue of the Archives of Ophthalmology.

Discussion. Dr. Alan C. Woods believed that lens protein had no inherent toxicity and that when properly prepared, lens extract was not toxic, thereby disagreeing with Gifford. A low grade uveitis following cataract extraction might be due in some cases to a sensitivity to lens protein and uveal pigment. In his experience, several of these cases when treated with lens extract and with pigment had shown remarkable improvement.

An etiologic study of a series of optic neuropathies

Dr. Alan C. Woods and Dr. William M. Rowland, read a paper on this subject. In this paper the question under discussion was chiefly the relative relationship of posterior sinus disease and of multiple sclerosis in the causation of optic nerve lesions. Analysis of the cases of 138 patients presenting optic neuropathies most of whom were admitted to the wards of the Johns Hopkins Hospital in various services, was presented. Of these cases 27.7 percent were due to syphilis; 10.9 percent were due to arteriosclerosis; 8.1 percent were due to posterior sinus disease; 6.5 percent were due to multiple sclerosis; 2.9 percent were due to focal infection; 4.4 percent were due to toxic amblyopia; 9.1 percent were due to miscellaneous conditions, while in 8.1 percent the exact etiologic factors could not be determined.

This paper has been published in full in volume 97, number 6, August 8, 1932, of the Journal of American Medical Association.

Discussion. Dr. Benjamin Rones said that a very valuable differential point in making the diagnosis between the retrobulbar neuritis resulting from multiple sclerosis and that due to other causes, was in the character of the scotoma. In the case of retrobulbar neuritis, the appearance of the cen-

tral scotoma was of very rapid onset, just as in the other types. However, in this case the scotoma disappeared entirely after a varying period of time, leaving the eye with normal central vision. Later on, there was a recurrence of the scotoma just as of the other symptoms of multiple sclerosis. It frequently happened that the eye lesions were the first symptoms of the general disease. Due to the improvement of the vision following the opening of the sinuses, it had been attributed to the operative procedure. However, in many cases this was only a coincidence and with a later recurrence of the eye symptoms and of the general symptoms, the diagnosis of multiple sclerosis became evident.

DR. JONAS FRIEDENWALD asked the criteria on which the diagnosis of sinus disease as the etiology of retrobulbar neuritis was made. He remarked that in England and Holland it was generally considered that so called retrobulbar neuritides were usually cases of multiple sclerosis.

DR. ALAN C. WOODS in answering Dr. Friedenwald's question stated that, if an infected posterior sinus was the only possible etiological factor found, then a diagnosis of retrobulbar neuritis due to the sinus condition was justifiable. Especially was such an assumption justifiable if these cases cleared up after the infected sinus was drained. It must be remembered, however, that some of these same cases might later show other signs and symptoms of multiple sclerosis. If the symptoms of retrobulbar neuritis disappeared after drainage of the posterior sinuses, and did not recur, except in cases of reinfection of the sinuses, then one had reason to be confident that the sinus condition was the causal factor.

The utilization of sugar in the eye

DR. FRANCIS H. ADLER presented a résumé of his work on the "Sugar content of the ocular fluids and the glycolytic activity of the tissues of the eye". This paper will appear in the Archives of Ophthalmology.

Discussion. DR. GEORGE A. HARROP said that as was mentioned in the paper just read there were two possible explanations for the difference in blood plasma and aqueous sugar content. The first was the sugar utilization by the tissues surrounding the aqueous and the second was the possibility that some of the blood sugar was bound by the blood proteins. The latter seemed very unlikely at the present time and the explanation advanced by Dr. Adler seemed most probable.

The explanation of the frequent changes in the refractive error in diabetic patients as being due to abrupt changes in blood sugar concentration was attractive but not very well to be reconciled with clinical experience. Several examples were cited.

Dr. Harrop congratulated Dr. Adler on his work. He would like to know the proportion of energy released by the retina in the oxidizing process as compared to that in the glycolytic process and also what the speaker considered was the meaning of the remarkable and unique physiological mechanism which he had discovered.

DR. J. FRIEDENWALD said that he thought that we could accept provisionally the interpretation that the blood-aqueous barrier behaved as an inert semipermeable membrane toward dextrose. The slight deficit in the aqueous sugar content might be explained away by the suggestions of Dr. Adler and Dr. Harrop. On the other hand, it might be an expression of the rate of filtration of the aqueous. The aqueous tended toward thermodynamic equilibrium with the plasma but did not quite reach this equilibrium. The explanation of the dextrose deficit of the vitreous, which Dr. Adler had offered was brilliantly substantiated by his most recent experiments.

He could not agree with the explanation, which Dr. Adler quoted Dr. Cowan as giving for the change in refraction in diabetes. The allowable differences in dextrose content between the aqueous and vitreous would not, according to his calculation, account for more than a fraction of a diopter change in refraction. According to Van Slyke and Peters the tissues developed a chlorid deficit in chronic acidosis.

When, at the onset of antidiabetic therapy, the blood regained its normal constitution, the tissues remained for a time hypotonic in comparison to the blood, and could recover their normal balance only at the expense of continued loss of fluid or extra ingestion of salt. As Duke-Elder had pointed out, this must lead to a swelling of the lens. In some experiments by Dr. Robertson and himself, they had measured the change in volume of the lens produced by change in the osmotic pressure of the surrounding medium. They found that a change in dextrose concentration produced practically no osmotic effect on the lens, while a change in salt concentration produced a great effect. This meant that the lens fibers were almost completely permeable to dextrose, less so to salt. Red blood cells showed an entirely similar behavior.

If one computed the change in refraction of the lens due to the change in volume, it would be found that the greatest effects occurred when the nucleus was well developed, and the changes in water content were confined to the cortex. This explained why the change in refraction occurred almost exclusively in persons beyond middle life.

The enormously high glycolytic power of the retina was of great interest in explaining certain pathological changes.

In the absence of oxygen, the glucose was split into lactic acid, and, if diffusion was interfered with, considerable amounts of acid must accumulate in the tissues. This explained the extremely rapid development of postmortem changes in the retina. It might, also, explain the extraordinarily high incidence of hemorrhages in the retina in vascular disease.

It was difficult to understand the functional significance of the extremely high metabolism of the retina, which according to Warburg, possessed not only an extreme power of glycolysis, but also an enormous oxygen consumption, and even an astonishing power to burn amino-acids. The actual visual act seemed to require oxygen, for sight disappeared in about ten seconds after obstruction of the circulation, as might be demonstrated by pressure on the eyeball. In its resting state, however, the retina split more glucose, than an equal weight of muscle in a state of high activity. Perhaps this great amount of energy was used to build up some unstable equilibrium which must explode in the visual act.

HARRY F. GRAFF,
Secretary.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Section of Ophthalmology

October 9, 1931

DR. DOUGLAS WOOD presiding

Visual acuity chart

DR. H. O. COOPERMAN (Minneapolis) presented to the members for inspection a pre-school visual acuity chart which he had constructed. All of us were aware of the difficulties experienced and the patience necessary in obtaining an accurate visual acuity test of the pre-school child. With this in mind, he presented this acuity chart that embodied recent advances in child psychology.

First: experimentation had shown that certain objects were familiar to the child of two years, who, according to Gesell, in the "Mental Growth of the Pre-school Child", was at the dawn of intelligence. He would recognize such objects as ball, dog, man, baby, cat, lady, and bed. The five year old in addition would recognize a doll, horse, chair, table, pencil, spoon, and hen.

Second: The pre-school child was attracted by color, especially the primary colors of red, yellow, and blue.

Third: A few objects at a time should be presented (one was ideal), as many objects tended toward confusion.

The criticisms of the present kind of chart, such as Reber's kindergarten chart were: (1) The objects were a monotonous black on a white background. (2) Too many of the objects were not recognized by a child be-

tween the ages of two and five years. (3) Offering a mass of objects to the child at one time confused him and failed to keep his attention. (4) The pictures, in the same visual test line, were not of the same size.

In this new chart, each picture was prescribed within a square (expressed in millimeters), which subtended a visual angle of five minutes at the distance at which the normal eye should distinguish the letter or object. The measurements were:

	mm. square
20/200	87.
20/100	44.
20/70	30.5
20/50	21.75
20/40	17.5
20/30	13.
20/20	8.5
20/15	6.25

Criticisms of this colored chart were: (1) Excellent illumination was required. (2) While each picture was inscribed within a definite square, the tendency was towards filling the center of the square, whereas the older chart tended toward the filling of the edges of the square (especially true of the smaller characters), thus giving the colored objects the appearance of being smaller.

WALTER E. CAMP,
Secretary.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

February 18, 1932

DR. HILLIARD WOOD, chairman

Iridodialysis, laceration of the sphincter of the iris and cataract in the same eye

DR. HERSCHEL EZELL reported the case of C. A., aged eighteen years who had been hit in the right eye with the end of a bridle rein twelve days before he came complaining of pain and loss of vision.

Examination revealed that vision in the right was fingers at 18 inches. There was slight pericorneal injection; the cornea was clear, the anterior chamber was restored; and the pupil was moderately dilated. The temporal border of the pupil showed an irregularity in outline due to a laceration of the margin. There was an iridodialysis extending downward about 4 mm. from the horizontal meridian. The temporal anterior cortex of the lens was partially opaque. The fundus appeared normal.

H. C. SMITH,
Secretary.

AMERICAN JOURNAL OF OPHTHALMOLOGY

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RECURRENT HEMORRHAGE INTO THE VITREOUS

It has been fifty years since Eales described the disease often known by his name; and single cases had probably been reported before that. Its causation has been discussed by almost every writer who has reported a case; but it still remains uncertain, in spite of the many suggestions that have been made regarding it. It does not seem probable that all of the cases reported as belonging to this group have been cases of tuberculous disease of the retinal veins. From his study of the literature, Finnoff decided that among 110 cases, 34 were tuberculous, while for 51 the cause was undetermined. He also concluded that 2 of the 5 cases seen by himself, were not tuberculous; chiefly because no reaction was provoked by tuberculin.

But with regard to tuberculosis it is almost impossible to prove a negative. In a large proportion of reported cases of ocular tuberculosis, the diagnosis has been reached without the identification of the tubercle bacillus. It rested upon the histopathology of the sections of tissue examined. The tuberculin reactions cannot be wholly relied on. In a case reported by Clapp (Amer. Jour. of Ophth., April, 1930) the first report was "no reaction". A more experienced observer reported that the reaction was "strongly positive". From the early use of tuberculin as a diagnostic test, cases of advanced pulmonary tuberculosis have been observed, that gave no tuberculin reaction. Evidently there is a certain balance of processes possible, where tuberculin does not cause the usual reaction.

It is probable that some cases classed as Eales' disease are not due to tuberculosis. Blood dyscrasia and endocrine dysfunction are attractive suggestions and worthy of further consideration. Finnoff holds "the hemorrhages are the result of a localized pathologic weakening of the blood vessels". That there is a basic local vascular disease, seems closely related to what is known, by the ophthalmoscopic study of cases due to tuberculosis.

It may well be that not tuberculosis *per se*, but some condition that arises in tuberculous patients, is the essential cause of recurring hemorrhages into the vitreous. Some writers have ascribed their cases to syphilis; but others have made the general statement, they are not caused by syphilis. Luetic degenerative disease of the arteries causes hemorrhage in elderly patients. But hemorrhage in early syphilis among young patients is quite unusual. We are reminded of the time when a large majority of cases of uveal inflammation were classed as syphilitic; focal infections and other causes being quite unrecognized.

The tendency of intraocular hemorrhage to recur is often observed clinically. Whether this, like epistaxis is due to local vascular disease is uncertain. After extensive intraocular hemorrhages, due to trauma, there may be recurrences at intervals of weeks and months, without known exciting cause, and followed by ultimate recovery. The conditions following hemorrhage into the vitreous, including absorption of clot and so-called retinitis proliferans, are peculiar. They suggest special attitudes of the ocular tissues toward extravasations of blood. Recurrences of inflammation characterize uveitis, scleritis, and keratitis, and sympathetic ophthalmitis, which closely resembles ocular tuberculosis in its histopathology.

The failure to observe more frequently the presence of local vascular lesions in the retina, may be due to vitreous opacities concealing them, and also to failure to search for them in the larger area of peripheral retina, where they most frequently occur. It must also be borne in mind that the retina is the only part of the body freely open to inspection, that has a terminal circulation, devoid of large anastomoses. This may be associated with the tendency to recurrences. The association of these hemorrhages with epistaxis, constipation and slow pulse, "under sixty per minute", and that they all occurred in young men between 14 and 20, and that "all these lads were much troubled with dyspepsia, low spirits and want of energy and feelings of lassitude", which Eales noted regarding his four cases, should be kept in mind. It may be something more than mere coincidence.

Attention has been called to the association of hemorrhage with low blood pressure, in tuberculous patients, probably through thrombosis favored by slowing of the blood stream. Eales states "The vessels in each eye were found to be large and tortuous, especially the veins, which were also remarkably dark colored." He was "inclined to attribute this combination of conditions to a neurosis, affecting both the circulatory organs and the digestive system". He noted the absence of high arterial tension and blood conditions known to cause hemorrhage; and also that the fathers of three of his patients had been "very subject to epistaxis for many years when young."

Eales' patients were under observation for many months. Some of those cases from which conclusions have been drawn by later observers, were seen only once, or for a period of a very few weeks. To settle the causation of this disease we need examinations of its histopathology; and good case histories extending over much longer periods. The recent reports of two cases are of the kind that may help carry forward our understanding of this condition, beyond the point where Eales had placed it fifty years ago.

In the case Clapp reported from the Wilmer Institute, the left eye had been blind, following injury by being struck by a baseball when the patient was 14 years old. When 18 years old his right eye became involved. The left eye was enucleated, and showed tuberculous lesions. The right eye showed consistent improvement only after tuberculin therapy was started, and under its use the lesion seemed to be entirely healed. When first seen the patient's family history included "mother and three sisters living and well." After twenty-six months this note is added: "The mother has recently died of tuberculosis, and the stepfather and one sister have active tuberculosis."

In the Illinois Medical Journal, December, 1931, Fringer reports a case

under observation for 22 years. The patient, a vigorous athletic boy of 16, when first seen, had chorioretinitis; and after that had five massive hemorrhages into the vitreous in 8 years. Although Wassermann and v. Pirquet tests were negative, by the advice of a consultant he was treated with mercury, potassium iodide, and pilocarpin sweats. He had been struck on the left side of the head, and the left eye had only light perception when he was first seen. That eye remained blind, but when last seen the right had vision of 20/30. Dr. Fringer believes that pilocarpin sweats are efficacious in stimulating absorption of these hemorrhages.

The follow up of these two cases makes them more valuable than a larger number of cases, seen for short periods. But, even in the last case, tuberculosis cannot be wholly excluded. The patient, whose case of chronic choroidal tuberculosis was reported in the birthday volume dedicated to Sir Wm. Osler in 1919, is still alive and in good health. It would seem from the combined statistics of Finnoff and Young, 182 cases, that tuberculosis causes more cases than all other determined causes of recurrent hemorrhage into the retina. In the present obscurity as to the final diagnosis of tuberculosis, it seems reasonable to expect that cases reported as illustrating Eales' disease should conform to the requirements of the situation, by very thorough search of the eye for vascular lesions, detailed histologic study of tissues where possible, and prolonged observation, of each case expected to add to our knowledge of recurrent intraocular hemorrhage. An eponymic is one named for its discoverer; but at best this is a temporary expedient, until the real cause or pathology of the condition has been worked out. In this instance the full recognition of cause and pathology has been long delayed. But more careful sifting of observations should end the obscurity that has been thrown about it.

Edward Jackson.

WEARING GLASSES

Glasses are of use only while they are worn. The patient gets help when the right glasses are before his eyes. Some ophthalmologists do not prescribe corrections because their patients will not wear them. Before we try to get a patient to wear glasses, it is worth while to make sure they are the right glasses for him, find out why he may dislike to wear them, and then explain to him why he should wear them.

"They make me look old", is a common objection. Glasses used to be seen on old people only. They were used for presbyopia, hundreds of years before astigmatism, or hyperopia, or exophoria were discovered. People, yet living, can remember when there were no laws for compulsory school attendance; and no one knew that crossed eyes and school headaches came from hyperopia, or astigmatism; or even from holding the book too close to the eyes.

The Greeks were close observers of the human form and face. Over 2000 years ago they knew near-sighted people "squinted" their eyes, to narrow the palpebral fissure. So they called that defect of sight, myopia. Other contractions of the facial muscles, in the effort to focus defective eyes, give the wrinkles and "crow's feet" at the corners of the eyes, that are the commonest marks of age. If people knew how constantly these come from the straining of the eyes, in the effort to see without glasses they might not fear these signs of age that they could so easily prevent. Even the optometrists, who advertise every point than can help the sale of glasses, have not made as much of this point in preventive medicine, as they might have done. Of course the "family doctor", who cannot be sure that he ought to urge his patients to have periodic health examinations, as the insurance companies urge them, will not be likely to advise the wearing of glasses to keep off the wrinkles of age.

Every new patient who needs glasses, has to be educated as to the need. The "oculist", who is too busy, or too lazy, to take the trouble to measure ametropia accurately, is likely to get rid of the patient by saying: "You do not need

glasses." So the ophthalmologist who prescribes glasses should be ready to explain to the patient why, how and when, they should be worn; and the difficulties of "getting used" to them. To do this is often the best service he can render his patient, and the greatest thing he can do for his own reputation. Of course, both service and reputation, depend on having made accurate measurements of the refraction; and knowing that his judgment of the need for glasses is correct. But good results also depend on the willingness of the patient to wear the glasses, constantly and long enough, to give them a fair trial. If they will not be thus worn it is best not to prescribe them.

Most patients, who have not passed through a previous experience of the kind, have very little conception of how difficult it may be to learn to use a new pair of glasses; so as to get the good of them. The importance and the difficulty of mastering the new adjustments of the eye and methods of eye work, made necessary by new glasses, must be strongly presented, before the glasses are given; to secure the full cooperation required. If this is not done, the patient is disagreeably surprised that the glasses fail to give, at first, the relief expected from them; and begins to think some mistake has been made. When he has entertained this suspicion, the explanation of the prescriber may not restore his confidence; but be regarded as an attempt to cover the supposed mistake. Only when the oculist has given full previous warning, of what will happen, does the patient gain confidence, that his adviser foresaw it, and really knew what he was about.

The discomfort of new glasses is often compared to that of wearing new shoes. Such a comparison, to something which the patient knows about, is helpful in gaining cooperation; although the difficulty to be overcome is really quite different in character. With the new shoes the trouble is chiefly mechanical pressure, or friction, from an imperfect fit. With glasses it is a learning to do something, new and different from what the eyes, and other parts concerned in vision, have been accustomed to. It might be more exactly compared to learning to write, or sew.

The adjustments and coordinations of the central nervous system are more delicate and complex for using glasses, than those of any kind of hand work. They are more like those of learning to play the violin, or to control the delicate muscles of the larynx for singing. The better the acuity of vision the more important such adjustments and coordinations become.

The trouble new glasses cause, may begin to grow less in a few days, or even from the first. But the full benefit they can bring will not be realized for two or three months. To make the patient understand that the use of glasses must be constant; and the absurdity of going back to the old glasses to "rest his eyes" —really to rest his central nervous system, where the struggle for a new coordination is going on—the process may be compared to writing, or sewing, with the left hand. Let him practice writing each morning with his right hand, and in the afternoon using his left; and see how slowly he learns to write with the hand he has never used for it. A few minutes actual trial, of holding the pen, or needle, in the left hand, will be more convincing to a righthanded person, than hours of explanation, or argument. The fact must be brought home to every wearer of glasses, that desirable, good results are only attained by giving up the bad habits of coordination, he had fallen into; and learning the better way, the new glasses require, until it becomes habitual. Wearing glasses is, like anything else we do, only learned by doing it. *Edward Jackson*

PREVENTION OF EYE ACCIDENTS

A very valuable and interesting safety conference was held in New York City on February the twenty-fourth, of this year, sponsored by the National Society for the Prevention of Blindness.

The three principal addresses were: "Injuries to the eye in industry", by Dr. Louis Schwartz; "Preventing eye injuries", by Mr. Harry Guilbert; and "Defective vision, the cause of acci-

dents", by Dr. Le Grand H. Hardy.

Dr. Schwartz, senior surgeon of the United States Public Health Service, New York City, had collected data from twenty-four states and on these statistics his report was based. He wrote to all of the states, but sixteen failed to reply and twelve wrote that records were not kept or were not available. A very significant feature was the lack of standardization of classification methods. It was necessary, therefore, for him to do a considerable amount of calculating and averaging in order to arrive at general conclusions and the figures could not be more than suggestive, representing as they did, mere estimates. Nevertheless the sources are sufficiently reliable for these estimates to be fairly accurate and are of enough value to justify bringing them to the attention of the ophthalmic profession.

It appears that ten percent of all accidents in the United States involve the eye. The total number incapacitating workers for one day or more, occurring in the United States in one year, is three million. Therefore it follows that three hundred thousand eye injuries occur. The question of the seriousness of these accidents is of great importance. The only light on this subject is from the total number of eyes destroyed by industrial accidents, the time lost, and the cost of such accidents.

In one year two thousand eyes are destroyed by injury in the United States.

The time lost would seem to be about 3,600,000 days, though this figure is only roughly approximate because of the variability of the different state averages in time lost per accident.

Considering five dollars an average daily income, 18,000,000 dollars are lost in time on account of eye accidents. Compensation varies tremendously but the average for all compensated cases has been about 375 dollars per case. The medical cost is usually about one-half to one-third of the compensation cost. The former totals 8,750,000 dollars and the latter 26,250,000 dollars or a grand total of more than 50,000,000 dollars as a conservative estimate of the cost of eye accidents throughout the United States each year.

There has been little variation in the number of accidents during the past few years.

From statistics, chiefly of industrial states, it would seem that sixty percent of accidents take place in industries of metal products and machinery; the building trade accounts for about seven percent. As for the causes of eye accidents, about eighty-five to ninety percent are from flying objects, while the remaining ten to fifteen percent are due to poisons and corrosive substances.

Mr. Guilbert, Director of Safety for the Pullman Company, Chicago, stressed above everything else the wearing of goggles to prevent ocular injuries. Where goggles are worn such accidents almost never occur. The difficulty lies in convincing the heads of the companies, the superintendents and the men of this fact. Perhaps the greatest drawback is the unwillingness of the supervisors themselves to wear goggles and it is only natural that the laborers do not feel that they should use goggles if the inspectors do not wear them. Practically all the accidents that occur in factories in which the wearing of goggles is demanded happen only when the protective glasses are laid aside. There is just one satisfactory method of handling the situation and that is to make the rule mandatory that goggles must be worn by everybody in dangerous industries and this must really mean *everybody* including executives and visitors.

The part played by defective vision in the occurrence of accidents was brought out by Dr. Le Grand Hardy who thought that the most common cause of eye strain or poor vision in any environment was defective illumination. He quoted Simpson who said that only twenty-five percent of the incandescent lamps installed in industrial plants were regulated to avoid glare. This of course is only one of the lighting defects. Possibly twenty percent of industrial accidents are due to this defect. Of all forms of accidents those occasioned by per-

sons falling are especially liable to be caused by poor lighting. In confirmation of this the increase of accidents in the winter months when artificial lighting is essential was cited. The most common defects of illumination are those of intensity and distribution. Dense, clear-cut shadows are to be avoided as they are confusing. They may be obviated by obtaining as nearly as possible diffuse illumination. Most artificial light is too yellow.

The direction of light is also important. The direct or specular reflection from the individual's work should never enter the eye and obviously the concentrated source of light should not be in the field of vision.

Since it is often difficult to obtain an illuminating engineer for conference it is of interest to know that any observer armed only with a copy of the American Standards Code of Lighting and a cheap foot-candle measure can estimate quite accurately the intensity of light.

Another factor involved is the eye itself. Statistics here are unreliable because of the psychological factor that the individual who has an eye defect often compensates for this by greater care. The incidence of poor vision is greater than generally supposed and to this must be added the ocular muscle abnormalities. Possibly as high as forty percent of industrial workers have some ocular imperfection.

Preemployment and periodic medical examinations with remedies of existing defects are lessons to be learned by industry from such studies as these. Though much of the work of states and other organizations is as yet unclassified and lacking direction, there has been great improvement. Order is slowly appearing out of chaos and there is accumulating a large mass of material from which industry may learn a great deal about the causes of accidents and may formulate plans by which to prevent these, for the most part, unnecessary occurrences. *Lawrence T. Post.*

BOOK NOTICES

A hand-book of ocular therapeutics. By Sanford R. Gifford. 272 pages, 36 illustrations. Price $3.25. Lea and Febiger, Philadelphia, 1932.

This small but remarkably complete and well written volume will be very popular. As his excuse for attempting it the author mentions the absence in the English language of a recent concise book on therapeutics. It is doubtful whether any better book on the subject will be found in any language. The author's own ability is familiar to many of his colleagues, and he modestly dedicates the volume "To the memory of my father Harold Gifford to whose knowledge, judgment and painstaking care of his patients anything of value in this book is due". Probably no more practical therapeutist ever lived than the elder Gifford.

The book is arranged in sixteen chapters, the first five of which are devoted to classification of various forms of therapy used in the eye and its adnexa, while the remaining chapters are devoted to classified application of therapeutics to different ocular structures and one or two special disorders.

The first chapter very practically discusses office and other equipment, the second deals with anesthetics, narcotics, and hypnotics. Drugs and organ extracts, specific and nonspecific protein therapy, and physical therapy are carefully outlined. Surgical operations are naturally excluded from consideration in this volume, but the preparation of the patient for operation, by the production of satisfactory local anesthesia, is dealt with admirably and completely.

The author recognizes the dangers of therapeutic credulity, and on the other hand of an excess of therapeutic nihilism. He acknowledges that by some, a good many of his statements may be considered overenthusiastic or radical, while others will be considered unduly skeptical in the face of apparently favorable evidence. But no one who reads this volume and uses it from day to day in his practice will deny that the author has formed honest and intelligent judgments upon the basis of ex-

tremely valuable training and experience. *W. H. Crisp.*

Modern retinoscopy, including the principles and practice of velono-skiascopy. Joseph I. Pascal, B.Sc., M.A., Columbia University. Cloth, octavo, 290 pages, 76 illustrations. London, Hatton Press, Ltd., 1930.

What is included in Modern retinoscopy is best learned by an examination of its table of contents. The first eight chapters, 77 pages are devoted to retinoscopy, or skiascopy as we have known it—the method of diagnosis described by Morton in a ten-page chapter of his 60-page book on refraction of the eye; or by Hartridge in the 32-page chapter of his manual. Then come three chapters, 48 pages on "cylinder retinoscopy" of Lindner, and after that a chapter on "a coordinated examination procedure". All the above treat of what is called "static retinoscopy"—retinoscopy as used to measure the "static refraction" of the eye.

Chapters XIII to XXII inclusive, 100 pages, deal with what is called "dynamic retinoscopy". These chapters are devoted to: the general scope of dynamic retinoscopy, the nature of accommodation and convergence, and innervational harmony between them, the "isodynamic method", determination of accommodative amplitudes, methods and applications, heterodynamic retinoscopy, special and secondary applications. The last three chapters, 48 pages, deal with velonoskiascopy, its principles of development, practical applications and outstanding features.

The author has chosen the term retinoscopy as more commonly used in English-speaking countries; although he admits that skiascopy is the more used in countries of Continental Europe. It is evident that dynamic retinoscopy is an objective method of studying the relations of accommodation and convergence; and velonoskiascopy of a kind of subjective skiascopy, based somewhat on the Scheiner experiment.

Being a graduate of Columbia University, and originally a licentiate in optometry, the author has entered upon his subject from the side of those who do not use cycloplegics. But on that side there has grown up a literature and teaching unfamiliar to ophthalmologists; which may be best understood from this book. Its unfamiliar point of view, and account of what differs so much from our usual practice, gives the book its chief value to many who have practiced and thought much about the shadow-test. The path of medicine is strewn with striking suggestions that never proved their superior, or permanent values; but these may prove suggestive to the alert mind, and should not be discarded without consideration. We have here the best account of cylinder-retinoscopy that has appeared in English, of Lindner's refinements of velono-skiascopy; and the author's knowledge of these things has been attained by working in Prof. Lindner's Clinic at Vienna. The author's own contributions to the literature have not been unduly emphasized.

In view of his modesty, it seems proper to refer to those which have previously appeared in this Journal, viz. The chromatic test for the dominant eye; 1926, v. 9, p. 357; The photoscope, 1927, v. 10, p. 48; and Practical retinoscopy with the photoscope, 1927, v. 11, p. 765; A sensitive test for equality, of accommodation, 1929, v. 12, p. 29; Light band in retinoscopy, 1932, v. 15, p. 137. These are all suggestive articles, valuable as provocative of thought. It is for their suggestive value, that the chapters on velono-skiascopy are recommended to the readers' attention. This method is not likely to supplant retinoscopy, or the usual subjective tests, but it affords one additional diagnostic resource, which may be quite helpful in some particular case. The book is well printed, with a good table of contents and a good index. The illustrations are mostly diagrams that help to a full understanding of the text.

Edward Jackson.

The etiology of chronic uveitis. Proceedings of Association for Research in Ophthalmology. Editor, Wm. L. Benedict. Paper 8 vo. 101 pages, illustrated. Philadelphia, 1931.

The seven papers and the discussions on them, contained in this volume, constitute a monograph upon its subject. Some of the papers are presented here more completely than they could be at the meeting, in Philadelphia, last June. There are also added lists of the officers and of the 190 members of the association. The bulk of the book is reprinted from the pages of this Journal, in which the papers originally appeared. But this monograph will be found more convenient for consultation, with reference to any particular phase of its subject.

The points of view from which the discussion was conducted are varied. They include: Infections of the Upper Respiratory Tract, Elective Localization in Determining the Etiology, Experimental Production of Chronic Uveitis, The Relation of Tuberculosis Endogenous Infections, and a Study of Syphilis in the Etiology of Chronic Uveitis. By the scientific work of its second annual meeting this Association has quite justified the hopes and efforts of those who brought it into existence.

Edward Jackson.

Collected reprints from the Wilmer Ophthalmological Institute of the Johns Hopkins University and Hospital, Volume 2, 1930-1931. Issued Baltimore, Maryland, February, 1932.

This handsome volume is actually made up by binding together forty-seven reprints of papers by members of the staff of the Wilmer Institute. It is rather remarkable that the pages of thirteen different journals and of volumes of society transactions should have lent themselves to uniform trimming and binding in a single volume. The most frequent journals of publication were the Archives of Ophthalmology and the American Journal of Ophthalmology. The volume opens with Dr. Wilmer's Trimble lecture on "The correlation of the appearance of the ocular fundus with certain more common bodily diseases".

W. H. Crisp.

Bulletins et mémoires de la Société Française d'Ophtalmologie, 1931. Paper covers, 710 pages, with numerous illustrations. Masson et Cie, Paris, 1931.

The year book of the French Ophthalmological Society for 1931 is arranged in the same manner as that of preceding volumes. The first section of 91 pages contains the by-laws of the society, the minutes of the annual meeting, a list of old and new members, and short obituaries of members deceased during the year. The second section is 196 pages long and consists of the annual report and discussions. The remaining 418 pages are devoted to the papers read at the session. The titles of some of these are as follows: A grave and late complication of dacryocystectomy, by Marin-Amat of Madrid; Tuberculous sclerokeratitis and its treatment by methylated antigen, by Colrat of Lyons; Diagnosis and prognosis of melanotic tumours of the iris, by Morax of Paris; Spontaneous fluctuations of the normal ocular tonus, by Amsler of Lausanne; Concerning the surgical treatment of retinal detachment, by Jeandelize and Baudot, of Nancy; and, Test of chromatic sense, by Polack of Paris. Abstracts of the more important articles will appear later in the journal.

The annual report is entitled Heredity in Ophthalmology and is presented by M. Van Dyse of Gand. It consists of a most interesting and complete treatise covering the entire subject of heredity as well as the special ophthalmological ramifications. Part one is introduced by a discussion of the laws of hybridation with special reference to the original experiments of Mendel. Following is a chapter entitled Anatomy and physiology of fertilization which deals with the quite recent progress made in cytology and microchemistry through which many of the fine details of the structure and properties of the reproductive cell nucleus have become known. This is

well illustrated by drawings. The next chapter, Theories on the mechanism of heredity, discusses preformation, epigenesis, theory of determinants, and continuity of germ plasm. The remaining seven chapter headings are descriptive of their contents: Sex and heredity, Variability, Value of the laws of Mendel in man, Heredity—Consanguinity, Familial hereditary affections, Hereditary malformations, true and false, and Heredity of acquired characteristics.

The second part deals with familial diseases and the hereditary malformations of the neuro-ocular apparatus. Chapter one is concerned with familial diseases of continuous heredity (type Mendelian dominant). In this type only the diseased individuals can transmit the malady; normal members of the same family do not transmit the condition. Among the diseases described under this heading are various types of congenital and adult cataract, malformations of the lens, familial degeneration of the cornea, certain types of glaucoma, and certain diseases of the sclera and lacrimal apparatus. Chapter two is entitled Familial diseases of discontinuous heredity (type Mendelian recessive). Here the disease may be transmitted by individuals who are themselves unaffected, and may skip one or more generations before reappearing. Under this heading are described albinism and various special types of retinal degeneration. The concluding three chapters are entitled: Familial diseases of maternal heredity, Hereditary malformations of undetermined mechanism, and Familial diseases of the neuro-ocular apparatus.

The report for 1932 will be given by Koby and Redslob and is entitled Biomicroscopy of the vitreous body in its normal and pathologic state.

Phillips Thygeson.

Transactions of the American Ophthalmological Society, Volume 29, 1931, Wm. Fell Company, Philadelphia. 591 pages.

During the past year the Society has lost ten of its members, many of these nationally known, two of them, Doctors W. E. Lambert and C. F. Clark, members for forty years, and one, Dr. Samuel Theobald, a member for fifty years. In the list were three past presidents of the society, Doctors Theobald, Lambert, and Hiram Woods.

Following the section on necrology appear the minutes of the proceedings, then the section on the program, and lastly, the accepted theses for admission to the Society.

Dr. J. H. Dunnington presented a case of exophthalmos in infantile scurvy with a discussion of this not infrequent association between the two conditions. Dr. F. A. Davis described the use of avertin in a fairly large series of ocular operations. He thinks that it has an important place in ophthalmology. Dr. Dunbar Roy described a case of unilateral traumatic ophthalmoplegia, an exceedingly rare condition. Dr. E. L. Goar had been successful in establishing drainage of tears through the nose in a case of congenital absence of the puncta by making an opening behind the caruncle and dissecting through the lateral wall of the sac. The condition had remained cured for two years. Dr. C. S. O'Brien presented a discussion on the cataract of postoperative tetany. This possibility should be thought of in cataracts in presenile persons, especially females. The type is that of cataracta complicata. Dr. Harry Gradle believes that cyclodialysis is a simple operative procedure and is definitely indicated in certain cases of simple glaucoma without inflammatory reaction. He thinks there is less danger of postoperative complications. Intrascleral nerve loops were described by Dr. Algernon Reese, with sections showing how these nerve loops pass through the sclera and may be seen through the conjunctiva. Dr. Jonas Friedenwald and Dr. H. F. Pierce described some preliminary work on circulation of the aqueous. Their views are not contrary to former findings. Drs. Alan C. Woods, Earl L. Burky, and M. B. Woodhall, discussed some of the properties of alpha crystalline. Dr. C. A. Clapp found that following injury to the lens capsule experimentally, repair began by the proliferation of the epithe-

lial cells starting by the forty-eighth hour. These cells seemed to endeavor to fill in the entire gap of the wounded capsule. Dr. Alfred Cowan described a membrane seen after removal of lens in capsule. The condition of the ocular structure immediately after the removal of the lens in capsule was described by Dr. F. H. Verhoeff, as indicating that no more trauma followed intracapsular removal than extracapsular. Dr. Daniel B. Kirby described the slitlamp picture of the anterior vitreous. He concluded that there was a condensation layer representing aggregations of ultramicroscopic micellæ limiting the vitreous anteriorly, which layer is in apposition with the posterior lens capsule except for a capillary space which contains a fluid presumably like the aqueous. Dr. Lawrence Post had found ultraviolet light to be of value as a stimulant in corneal disease. Dr. Francis Heed Adler noted that in experimentally produced retinal atrophy in cats there was an increased concentration of sugar in the vitreous. The glycolitic activity of the atrophied retina was considerably less than normal. In a beautifully illustrated article Dr. Bernard Samuels demonstrated epipapillary tissues microscopically. The two principal classifications were congenital and acquired. Doctors F. H. Hessler and T. L. Squire measured the retinal vessels by means of fundus photography. The presence of vitamin A in the retina of the hog was demonstrated by Dr. Arthur N. Yudkin. Practically none was found in the choroid. Dr. Frederick T. Tooke reported four cases of retinal separation in nonmyopic eyes, in all of which the outcome was most satisfactory. Three were treated with the cautery introduced only a short distance into the vitreous and with no attempt to reach the tear. The other case was treated nonsurgically. Dr. Harvey D. Lamb reported five cases of sympathetic ophthalmia in which the sections illustrated proliferation on the surface of the uvea. A comparison of the second and eighth nerves was given in great detail by Dr. Clifford B. Walker. Dr. G. E. de Schweinitz reported blindness and choked disc in Guernsey bull calves, with pathologic specimens in two cases. The conclusion was that it represented a special or familial disease depending on inbreeding. Dr. Albert E. Bulson concluded from one case and a review of the current opinion that choked disc could be caused by suppuration of the sphenoidal sinus. The eye findings in measles and encephalitis were reviewed by Dr. Parker Heath. A case of transitory blindness eleven days after measles and preceding encephalitis was cited. Two cases of albinism in progeny of negro and white parents were reported by Dr. Charles M. Swab. Subnormal accommodation in patients under the presbyopic age is not infrequent according to Dr. D. De H. Prangen who thinks focal infection, particularly dental, is the major cause.

The section on pathology contains discussions of nine different conditions.

The following 169 pages are devoted to the accepted theses of candidates for the society. They are all extremely interesting and well worthy of perusal. The authors are: Drs. Alexander E. MacDonald, Walter I. Lillie, J. A. MacMillan, E. F. Krug, E. N. De Witt, and Le Grand H. Hardy.

Under instruments and appliances Dr. John Green described the use of suprarenin bitartrate, a substitute for laevo glaukosan. Dr. Nelson M. Black demonstrated a binoculator for the exercise of extrinsic ocular muscles.

This volume is one of the largest and most interesting that the Society has ever published. It has been very carefully edited and beautifully printed. It reflects much credit on editor and publisher. *Lawrence T. Post.*

ABSTRACT DEPARTMENT

EDITED BY DR. WILLIAM H. CRISP

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases and parasites
18. Hygiene, sociology, education, and history

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3. PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Whittington, T. H. **A new device for training and testing binocular vision.** Brit. Jour. Ophth., 1932, v. 16, Feb., p. 105.

The usual stereoscope and holder are used. The principle of training binocular vision, and later fusion, by coordination of eye and hand is made use of in a drawing stereoscope. Wax tablets are placed in the holder, in front of which is a picture on tissue paper, this being covered by a piece of transparent celluloid. A style is used to draw with. The teacher draws over the whole picture on one side. The child watches and is told to do the same on the opposite side. The pictures are simple. The impressions made on the wax tablet may be easily effaced and the tablet used many times. (One illustration.) *D. F. Harbridge.*

5. CONJUNCTIVA

Belfort, Fabio. **The present status of the etiology of trachoma.** Revista de Ophthalmologia de S. Paulo (Brazil), 1931, v. 1, no. 1, pp. 16-32.

This sixteen-page article is an excellent review, in Portuguese, of present-day opinions on this subject.

W. H. Crisp.

Blatt, N. **Replantation, a new operation for pterygium.** Zeit. f. Augenh. 1932, v. 76, Jan., p. 161.

When a very large pterygium is treated by one of the older surgical procedures an ugly irregularity of the conjunctiva frequently results. The author has devised a method which results in a perfectly smooth surface, practically indistinguishable from normal. He undermines the neck of the pterygium, abscinds the head, scrapes the denuded cornea until it becomes clear, and with two parallel incisions toward the limbus frees the entire pterygium as a flap. Sutures are placed in the four corners of this rectangular flap, after which it is abscinded at its base by a vertical cut, turned through 180°, and sutured in place with its base toward the cornea. If the sutures have not sloughed out earlier, they may be removed on the fifth day. *F. Herbert Haessler.*

Houwer, A. W. **Cysts of the fornix conjunctiva and epitarsus.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 721. (Ill.)

A cyst of the lower fornix in a woman aged twenty-four years, and one of the upper lid in a boy aged two years, are described. The anatomical examination of one case, which is given in detail, confirmed the origin of the cyst from epitarsus. Many formations designated as "epithelial proliferations, new-formed or dystopic glands" are probably epithelial remnants under an epitarsus or under epitarsus-like duplicated conjunctival folds. *C. Zimmermann.*

Jordan, S. **A contribution to conjunctival tuberculosis.** Zeit. f. Augenh., 1932, v. 76, Jan., p. 147.

The author records his findings in two cases of tuberculosis of the conjunctiva, neither of which fits completely into any one of Sattler's four groups. In the first patient a small mass of tissue was excised from the entirely uninflamed conjunctiva and was found to be tuberculous. Two small retinal lesions found later, with evidence of a pulmonary lesion, induced the author to conclude that the conjunctival lesion was due to hematogenous metastasis.

The other patient, the nurse whose conjunctival lesion was described by Wollenberg (Klinische Monatsblätter für Augenheilkunde, 1926, volume 178, supplement page 135), suffered a recent recurrence. The conjunctiva of the lower lid was red and swollen, and in the fornix, including a small part of the conjunctiva bulbi, was a broad slightly protuberant yellowish mass. There was no exudate and only slight epiphora and photophobia. The diseased area was extirpated, and on histological examination a subjunctival inflammatory granular tissue with amyloid degeneration was found. The biopsy wound did not heal, and the edge became involved in a lesion similar to the one excised. No general manifestaton of disease could be found except for a positive Mantoux test. After several recurrences, healing followed tuberculo-therapy and transplantation of the buccal mucosa. Tuberculosis is the probable etiology, though that assumption certainly is not unequivocal. In the absence of swelling of the regional lymph nodes it is probable that we are dealing with an exogenous reinfection. *F. H. Haessler.*

Lumbroso, Ugo. **Experimental trachoma: state of the question and attempts at reproduction of the disease with new bacterial strains isolated in Tunis.** Arch. Institut Pasteur Tunis, 1931, v. 20, Dec., p. 253.

Lumbroso has tested for pathogenicity on monkey and human conjunctivas the new bacterial strains isolated by him from cases of trachoma in Tunis. The microbes of type A produced granular lesions of rapid evolution on the conjunctiva in two of seven monkeys inoculated. In one of these there appeared to be formation of cicatricial tissue. Type B strains produced typical granular lesions in four of five animals inoculated, while strains of type C gave lesions in only one of four attempts. In none of the animals did marked tarsal involvement, so characteristic of the human disease, result, but Lumbroso reminds us that the monkey presents only a minimal susceptibility to trachoma.

On the human conjunctiva a microbe of type A produced a moderate inflammatory reaction with some follicle formation which, however, proved only transitory. Inoculation with type B strains in two other subjects produced lesions characteristic of attenuated trachoma. Inoculation with a type C microbe proved negative. Lumbroso concludes that his type B strain has shown a special pathogenicity for the human conjunctiva and that it may be concerned in the etiology of trachoma.

Phillips Thygeson.

Lumbroso, U., and Van Sant, H. **New bacterial strains isolated from cases of trachoma in North Africa, following the technique of Noguchi.** Arch. Institut Pasteur Tunis, 1931, v. 20, June, p. 137.

Lumbroso has studied twenty-nine cases of trachoma and has failed to recover Bacterium granulosis from any of them. The bacterial strains recovered by him were at first thought to be identical with Noguchi's microbe but later work showed distinct differences. The new strains, eighteen in all, consist of

small bacteria varying morphologically from cocco-bacilli to distinct rods. They appeared to differ slightly and on the basis of morphological and cultural characters Lumbroso has divided them into three types.

Type A consists of minute cocco-bacilli, Gram-negative, which grow abundantly on enriched media and which produce, after twenty-four hours at 25°C. a distinct yellow pigment which turns brown on aging. They ferment certain sugars irregularly and lightly. Type B consists of minute Gram-negative bacteria, quite polymorphic but more often appearing in distinct bacillary form. They grow profusely on enriched media and produce a dull golden pigment which tends to take on a greenish tint with age. Action on carbohydrates is more pronounced than in type A.

Type C consists of minute Gram-negative bacilli, often appearing in diplobacillary form. Here the pigmentation varies from a whitish gray in recent cultures to a bluish-gray in old ones. Carbohydrates are not attacked. All three types were devoid of pathogenic action when inoculated intraperitoneally in the ordinary laboratory animals. Their action on the conjunctiva is to be reported in a future communication.

Phillips Thygeson.

Oláh, Emil. **Practical method of examining great numbers of conjunctival sacs at a time, especially in trachoma regions.** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 95. (Ill.)

Oláh has devised an instrument for examining the conjunctival sac so that the hand of the surgeon does not need to touch the eye. It consists of a handle the size of a lead pencil, with a blunt curved hook 2 mm. thick at one end, and a spatula at the other. Ten pairs suffice for examining many people, two being required for each eye. Its application is described in detail. *C. Zimmermann.*

Papolczy, F. **Contributions on the connection between plasmoma and trachoma.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 773.

Papolczy considers plasmoma as an inflammatory granulation tumor originating in the trachomatous conjunctiva. The predominance of plasma-cell infiltration sometimes found in very recent trachoma proves that the disposition exists from the beginning of the disease. In these cases true plasmoma may develop in time. Although it generally occurs after many years, several early cases are known. The reason for development of the plasma-cell inflammation or tumor must be sought in the different individual arrangements of the tissues. *C. Zimmermann.*

Piquero, P. **Trachoma and constitution.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, Feb., p. 87.

Constitution is an important factor in the acquisition and evolution of trachoma. The hypochromatic are easily infected and easily cured, those of thymolymphatic status and exudative lymphatic diathesis resist infection and are hard to cure, the lympathic asthenic type resists infection but is easily cured, and the herpetico-arthritics are predisposed and hard to cure. Clinical polymorphism represents only stages in the evolution of the disease, of which five are recognized. If treated in first and second stages restitutio ad integrum is possible but relapses are not uncommon. Polymicrobism and polyvirulence are to be considered as factors. Based on studies in the Spanish province of Badajoz, where the semitropical lowlands are mainly infected, and where lack of fats and vitamins in the diet has been noted, climatic and dietetic factors are suggested as to be considered in fighting the scourge. *M. Davidson.*

Torres y Torres, A. **Purulent conjunctivitis of the new-born.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, Feb., p. 65.

The writer believes that the frequency of this condition in Spain is 2 to 3 percent. Of 175 cases treated, six resulted in bilateral blindness, seven in unilateral blindness, and five in leucoma. Pure gonococcus infections were found in thirty-nine cases only. Two, characterized by scanty secretion, were of in-

clusion conjunctivitis. Pneumococcus, streptococcus, and Loeffler's bacillus infections were the most serious. Most infections were traced to examination during parturition, one to ante-partum examination. The greatest prevalence was in the spring and the fall. Four of the six cases resulting in total blindness had had prophylactic instillations of over five percent silver nitrate before admission to the hospital. The writer advocates abandonment of the prophylactic use of silver nitrate, except for therapeutic purposes and in the absence of corneal complications, and would use argyrol instead. Protein therapy is used in all cases with gratifying results.

M. Davidson.

Treatment of trachoma with Tragynol (Bayer). Fifth annual report Giza Memorial Ophthalmic Laboratory, 1930, p. 67. (No author's name given.)

Tragynol (Bayer) is the trade name of a preparation originated by Lubermann, and consisting of neutral chaulmoogra oil combined with copper sulphate in ointment form. As a result of treatment conducted on seventy cases of trachoma, of which forty-nine attended regularly, the following conclusions are given: (1) Treatment with Tragynol results in more rapid scar formation than most forms of treatment, this being most noticeable in cases of papillary hypertrophy. (2) The scar formation is fairly uniform and no cases of distortion of the eyelids as a result of the treatment have so far been seen. (3) On the whole the treatment is well tolerated. (4) No serious complications have resulted from the treatment although certain cases with a clear cornea developed temporary corneal infiltration.

Phillips Thygeson.

Wilson, R. P. **Experimental studies in relation to Bacterium granulosis.** Fifth annual report Giza Memorial Ophthalmic Laboratory, 1930, p. 56.

Wilson summarizes his experimental work on Bacterium granulosis as follows: (1) Pure cultures of Bacterium granulosis in thirteen monkeys utterly failed to produce chronic granular conjunctivitis. (2) Inoculation of monkeys with infected monkey tissue (animals infected in the United States with Bacterium granulosis and brought to Egypt), or secretions therefrom, never failed to give good positive results even in monkeys refractory to pure cultures. (3) Bacterium granulosis is capable of inducing in the human conjunctiva an acute conjunctivitis of short duration. The inflammation is accompanied by mild granular lesions which, however, disappear without treatment, leaving no permanent sequelæ. (4) Tissue transfers from monkey to human conjunctiva have so far failed to produce granular lesions. (5) Bacterium granulosis has never been recovered from Egyptian trachoma.

Phillips Thygeson.

Wilson, R. P. **Some observations from an investigation into the ophthalmic welfare of Bahtim Village.** Fifth annual report Giza Memorial Ophthalmic Laboratory, 1930, p. 62.

This is a continuation of the survey published in the annual report for 1929. (See American Journal of Ophthalmology, 1931, volume 14, July, page 715.) The general conclusions drawn from the work are as follows: Children born in the hot summer months develop trachoma at an earlier age than those born in the winter months, the average age of onset in the former being four or five months while in the latter it is seven or eight months. In the great majority of cases there is a preceding organismal conjunctivitis, either chronic or acute. In such cases the Koch-Weeks bacillus has been most commonly found and it has been astonishing to note the frequency with which this bacillus apparently gives rise to a chronic conjunctivitis. The usual interval which elapses between the onset of an acute mucopurulent conjunctivitis and the first definite signs of trachoma is from one and one-half to three months, whether the attack be in summer or winter.

Judging from the present investigation, it would appear that trachoma is almost always preceded by some other bacterial infection of the conjunctiva. General experience, however, would

lead one to believe that a preceding infection is not essential for the development of trachoma but merely promotes the appearance of that disease.

Phillips Thygeson.

6. CORNEA AND SCLERA

Bücklers, Max. **Bilateral horse-shoe opacity in morbus ceruleus.** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 1.

In a woman aged thirty-three years, affected with morbus ceruleus due to congenital stenosis of the pulmonary artery and defect of the septum, both corneas presented eccentrically symmetrical figures, apparently ruptures or kinks in Bowman's membrane, perhaps consequent on a minimal flattening of the corneal center. A direct connection with the morbus ceruleus was not probable. *C. Zimmermann.*

Erlanger, Gustav and Alice. **Treatment of scleritis with calcium-adrenalin (histamin iontophoresis).** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 93.

The authors report very rapid and satisfactory results in scleritis with histamin in strength from 1 to 5000 to 1 to 10,000, introduced by iontophoresis.

C. Zimmermann.

Fleischer, Bruno. **Stereoscopic photography of the hemosiderin ring in keratoconus.** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 13. (Ill.)

With the stereoscopic iris camera of Zeiss, Fleischer obtained a very good photograph of the hemosiderin ring of a bilateral keratoconus in a woman, aged twenty-seven years. The diameter of the cornea was 11.25 mm., that of the ring 6.25 mm., in agreement with the few published illustrations. Exact measurement of the ring in future cases will be of interest. *C. Zimmermann.*

Gifford, S. R., **The mild form of epithelial dystrophy of the cornea.** Arch. of Ophth., 1932, v. 7, Jan., pp. 18-30.

Fuchs first described epithelial dystrophy of the cornea in 1910. It must be distinguished from glaucoma, changes following cataract extraction, and neuroparalytic keratitis. Fuchs found the typical lesions on an average of once in 20,000 cases. The patients suffering from the mild form usually complain of a scratchy feeling of the eyes and loss of vision, the latter improving as the day advances. Most of the patients are in middle life or later. In the typical cases in their early stages, ophthalmoscopic examination with plus 10.00 D. sphere will show a number of fine black dots against the red reflex. Moderate chronic catarrhal conjunctivitis and blepharitis are often seen. With the slit-lamp, after staining with fluorescein, 500 to 600 minute stained areas can be made out in the epithelium and numerous tiny blebs may also be noted. Droplets of edema can be seen among the epithelial cells. Punctate white dots, probably the result of former ruptured blebs, are numerous. In the stroma linear opacities can be seen. Endothelial droplets are numerous. In one case such droplets were the only lesions observed on the first examination, the others appearing later. In almost all cases there is more or less loss of sensitivity in the cornea. The tension, as a rule, is quite low.

Two forms are met with, the mild type far more frequently than the severe. They do not appear to pass from one to the other. The mild form responds rapidly to ethylmorphine hydrochlorate, used in a 2.5 to 5 percent solution, along with a mercury cyanide solution. Phenacain may be substituted to advantage, as it is not only an anesthetic, but also a stimulant to the corneal epithelium. *M. H. Post.*

Kolen, A. A. **A simplified form of Denig's operation.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 790.

The favorable influence of peritomy in trachomatous pannus with thorough removal of the episcleral tissue, and excision of a sufficiently broad strip, and subsequent formation of a wide and firm scar, or of Denig's transplantation of mucous membrane of the lip, seems to be due to the creation of a barrier. Hence Kolen considers the transplantation of mucous membrane of the lip superfluous and, after excision of a semicircular piece of the conjunctiva at the upper limbus, transplants a corre-

sponding piece of conjunctiva from the lower limbus, with a pedicle at the medial angle. This need not be absolutely free of the trachomatous process, as a firm scar will be formed even then. From his good results in eighteen cases, tabulated in detail, the author recommends this method. *C. Zimmermann.*

Mattos, W. B. **Traumatic scleral cysts.** Revista Ophthalmologica de S. Paulo (Brazil), 1931, v. 1, Aug., pp. 107-110.

Within two months the author had the unusual experience of encountering two cases of scleral cyst due to trauma. The first was in a man of twenty-seven years who fourteen years previously had received a blow in the right eye from a stick. The small remaining elevation had steadily increased in size during the past six months. Upon fixation with forceps, the cyst ruptured and a perfectly transparent watery fluid escaped. The anterior wall was resected, and the posterior wall thoroughly curetted. The second patient was a man of twenty years whose right eye had been buphthalmic and divergent as the result of an accident nine years previously. A very large leucoma occupied the external half of the cornea, and at the nine o'clock position in the sclera there was a subconjunctival cyst adherent to the sclerotic and measuring 7 mm. in its maximum diameter. After iridectomy, the anterior wall of the cyst was resected. It became evident that there was communication between the interior of the cyst and the interior of the eyeball, but the cyst did not reform. The article is accompanied by beautiful stereoscopic photographs of the two cases.

W. H. Crisp.

Mikaeljan, R. C. **Studies on pneumococcus in the eye.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 778.

Investigations by Neufeld and Händel and bacteriologists of the Rockefeller Institute yielded four serological types of the pneumococcus group. For ascertaining these types Mikaeljan examined seven cases of serpent corneal ulcer, seven of purulent dacryocystitis and one of panophthalmitis. His method is described in detail and the results tabulated. At Leningrad types one and two prevailed in serpent ulcer and dacryocystitis (in contrast to some findings at other places). Possibly the results are in connection with corresponding epidemiological observations at Leningrad. *C. Zimmermann.*

Samuels, Bernard. **Method of formation of the posterior abscess in ulcus serpens.** Arch. of Ophth., 1932, v. 7, Jan., pp. 31-39.

The origin of the posterior abscess in ulcus serpens is thought to be either from the deep ciliary vessels anterior to Descemet's membrane, or from the iris by way of the aqueous. The fixed corpuscles of the cornea disappear more or less in the neighborhood of the ulcer. There may be great infiltration with necrosis of the fixed corpuscles in the immediate neighborhood, a border slightly infiltrated with widespread necrosis of the fixed corpuscles, one moderately infiltrated with moderate necrosis of the fixed corpuscles, or one without infiltration where the leucocytes have disappeared following the cleansing of the ulcer. The posterior abscess may lie in the posterior cortical layers, or in Descemet's membrane. In the author's fifty cases there were instances of posterior abscess without exudation and of exudation without abscess, and with both abscess and exudation. According to Leber, the origin of the foci of leucocytes is the result of diffusion of toxic substances by the pneumococci within the corneal tissue toward the periphery or through the cornea into the aqueous. In the first case dilatation of the marginal bloodvessels takes place, liberating leucocytes from both the deep and superficial vessels, and in the second place producing a similar effect upon the vessels of the iris. Posterior abscess without hypopyon may result in cases where the toxicity is sufficient to stimulate the marginal vessels, but not sufficient to cause disturbance in the iris great enough to produce more than a negligible number of leucocytes. Hypopyon without posterior abscess may result from a toxicity so great as to destroy

those leucocytes arising from the limbal vessels, but not sufficiently powerful to destroy those arising from the vessels of the iris. Where both hypopyon and abscess are present, the toxicity is just sufficient to excite emigration from both sources. In six cases leucocytes were seen along the anterior surface of Descemet's membrane, extending from the abscess to the ciliary vessels. In twenty-two of thirty-two cases of abscess with exudate, a definite connection was seen anterior to Descemet's membrane, while in ten invasion appeared to be from the aqueous through Descemet's membrane. In twelve the origin could not be determined. The posterior abscess is usually the last of the three to disappear, and may do so either by absorption within the cornea or in the aqueous after rupture of the abscess.

M. H. Post.

7. UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Busacca, Archimede. **Anatomical and clinical observations of Koeppe's nodules of the pupillary fringe in iridocyclitis.** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 14. (Ill.)

Busacca has studied the origin and structure of these nodules for years and gives here his clinical observations, supplemented by anatomical examination of the right eye of a woman aged sixty-three years which was enucleated for melanosarcoma of the choroid. From his investigations he distinguishes two types according to different appearance, nature, origin, and significance, in accordance with Koby's classification of ectodermal and mesodermal nodules which are termed "nodules" and "flocculi." The nodules develop in the ectodermal layers of the iris and in the second stage penetrate into the uveal stratum. "Floccules", however, are round structures on the mesodermal layer, more rarely on the nodules. They represent exudates from the iris tissue and corpuscles floating in the aqueous, which accumulate on small ulcerated zones of the anterior surface of the iris. Busacca found these in iridocyclitis of varying etiology, in tuberculosis, lues, and disturbances of metabolism, with eosinophilia from five to eleven percent. The nodules may be of similar clinical appearance but of different structure and thus of different significance and etiology. Iridocyclitis with nodules heals less completely and is more subject to relapse. The nodules need weeks for absorption, the flocculi only a few days. The flocculi leave no traces, the nodules an interruption of the pupillary fringe.

C. Zimmermann.

Lamb, Harvey D. **Sympathetic ophthalmia from a nonperforating trauma: report of a case.** Arch. of Ophth., 1932, v. 7, Jan., pp. 97-100.

Sympathetic ophthalmia developed in a child of six years after a blow in the right eye, which caused an abrasion of the cornea but no penetration of the globe. The left eye became involved two months later. The right eye was enucleated by Dr. W. E. Shahan. Eventually the vision in the remaining eye was completely lost. The pathological findings in the enucleated right eye were typical of a sympathetic iritis and cyclitis. "Fibrinoplastic exudate was small in amount; it formed some posterior synechial and pupillary membranes."

No case of an identical nature could be found in the literature. Yet, since true sympathetic ophthalmia may follow necrotic sarcoma of the choroid, it is evidently possible that it might occur without a perforating wound. Several similar cases are reviewed.

M. H. Post.

Scheerer, Richard. **Sympathetic ophthalmia or luetic iritis?** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 41.

In a man aged forty-one years the right eye, which was blind from contusion with perforation in November, 1930, was again painful on September 25, 1931. It was enucleated the next day. On November 2 the left eye showed violent iritis with numerous deposits on Descemet's membrane, opaque aqueous, and a broad posterior synechia. There

was a slight drawing of the pupil upward next to the nodule at the posterior synechia. The patient had a history of transient measles-like rash two years previously. The Wassermann was positive. After a dose of neosalvarsan the posterior synechia disappeared immediately, and after its continued use the iritis healed, with normal vision.

C. Zimmermann.

Trivissono, Ernesto. **Sympathetic ophthalmia.** Boletin de Informacion Oft., 1931, July-Aug., p. 205.

The patient was a woman about thirty years of age. When sixteen years old she was accidently hit in the left eye with the sharp end of a pair of scissors, which caused a cataract. In spite of the author's advice against cataract extraction, the patient had the lens removed in November, 1930, with an immediate infection occurring in the eye. The patient refused to have the eye enucleated and apparently improved under the usual treatment.

Seven months later a slight pain developed in the left eye and vision in the right eye was reduced to about 1/200 in twenty-four hours. The left eye was immediately enucleated and the usual treatment with foreign protein and atropin instituted, so that in about five weeks vision was restored to 20/20 and the eye was apparently well.

Hugo Lucic.

8. GLAUCOMA AND OCULAR TENSION

Apin, Carl. **On the principles and methods of clinical tests of the tonometer.** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 66.

Apin considers it practical to test tonometers in three ways: (1) adjustment of the instrument (weight, loading, size, and function of the individual parts); (2) testing the instrument on the eye of the cadaver (units of measurement, deviations from the manometric value, incidental influences); (3) clinical test on the living eye.

C. Zimmermann.

Duke-Elder, W. S., Duke-Elder, P. M., and Colle, J. C. **The effect of adrenalin on the intraocular pressure and its clinical significance.** Brit. Jour. Ophth., 1932, v. 16, Feb., p. 87.

From experimentation on animal eyes and on the artificially perfused human eye, it appears that the action of adrenalin upon the eye itself, uncomplicated by the effects on the general circulation, is fourfold: (1) In small doses it dilates the capillaries and raises the intraocular pressure; (2) In large doses it constricts the arterioles and capillaries and lowers the pressure; (3) In any dose it constricts the plain muscle of the orbit and raises the pressure; and (4) It dilates the pupil, an action which appears to be without any significant influence on intraocular pressure.

In man the action of Müller's muscle in raising intraocular pressure will be very much less than in the dog, owing to its very small development in the former; it may probably be neglected altogether. Apart from this, the present investigation accounts for the variability of the action of adrenalin upon the pressure of the eye. Depending upon the dose in which it becomes effective in the eye it will either dilate the minute vessels raising the pressure, or constrict them to lower the pressure, and the possibility of the constriction becoming effective will depend upon the extent to which the drug is absorbed into the general circulation. The fact that the vessels of the eye react less markedly than those of large areas elsewhere in the body (particularly in the skin, and in the heart itself) makes ocular changes subservient to general changes. (Seven blood pressure diagrams and seven references.) *D. F. Harbridge.*

Linksz, A. **So-called physiological sealing of the pupil.** Arch. f. Augenh., 1932, v. 105, Jan., pp. 526-536.

Using the method of Nakamura, Mukai, and Kosaki, Linksz found that if methyl violet was put in the conjunctival sac the portion of the lens capsule exposed in the pupillary area took the stain. This occurred only with the coarser colloidal substances. If the fine colloidal suspensions were used, the stain passed through the pupillary area

into the posterior chamber. This would tend to prove that there is a certain sealing of the pupillary area, but not, as has been contended, sufficient to prevent aqueous from passing through the pupillary area into the anterior chamber.

Frederick C. Cordes.

Müller, H. K. **Intraocular pressure and age.** Arch. f. Augenh., 1932, v. 105, Jan., pp. 504-515.

Müller took tonometric measurements with an original Schiøtz tonometer in sixty post-mortem eyes in situ. The results were classified according to age into three groups. In the group from 1 to 10 years of age, the average reading was 29.5 mm. Hg; from 20 to 44 years of age the average was 26.5 mm. Hg, while in persons over 45 years the average intraocular tension was 25 mm. Hg. The author also gives in detail his method of taking the tension.

Frederick C. Cordes.

Müller, H. K. **Margin of error in determining intraocular pressure with the Schiøtz tonometer.** Arch. f. Augenh., 1932, v. 105, Jan., pp. 516-525.

Müller states that the heavier the tonometer weight the greater the possibility of error. With the 5.5 or 7.5 gm. weight, one must allow for a variation of 5 mm. Hg. With the 10 or 15 gm. weight, the margin of error is 7 mm. Hg. By determining the curve of normal intraocular tension for various ages, the range of error may be reduced somewhat.

Frederick C. Cordes.

Stevenson, C. P. **Glaucoma and its treatment.** Revista de Ophthalmologia de Sao Paulo (Brazil), 1931, v. 1, Nov., pp. 149-167.

The author has used a combination of the features which he regards as most desirable in the procedures of Herbert, Lagrange, and Elliot. The scleral incision and resection are done according to the Lagrange technique. Peripheral is preferred to complete iridectomy. (Nine illustrations.) *W. H. Crisp.*

Weiss, A S. **On twenty-four hour fluctuations of intraocular pressure in glaucoma.** Russkii Opht. Jour., 1931, Aug., p. 93.

In normal eyes and in prodromal glaucoma, the intraocular pressure is highest in the morning and gradually decreases toward evening. In chronic and absolute glaucoma this pressure curve is often irregular. The higher the tension, the wider the amplitude of these fluctuations. *M. Beigelman.*

9. CRYSTALLINE LENS

Almeida, A. de. **Artificial ripening of cataract.** Revista de Opthalmologia de S. Paulo (Brazil), 1931, v. 1, Aug., pp. 100-106.

In a series of cases here described, the method of Forster was employed. The anterior chamber was opened with the lance keratome. After an iridectomy, the anterior chamber was completely emptied by pressure with a spatula on the posterior lip of the incision. The lens was then massaged with a Daviel curette, through the cornea, using about thirty circular movements parallel with the limbus and causing the lens "to dance under the curette". The anterior chamber was then emptied again with the spatula and a second series of circular movements undertaken in the opposite direction. The cornea must be kept moist during this procedure. The development of cortical opacity proceeded rapidly, and in most cases it was possible to extract the cataract easily after a month. One disadvantage was found to be development of more than the usual amount of astigmatism after the final operation. *W. H. Crisp.*

Mendoza, R. **Elschnig's intracapsular extraction of cataract.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, Feb., p. 85.

The author comments on the principle of Elschnig's procedure, which is regarded as a Smith operation plus the use of forceps to prevent premature breaking of the upper zonule and luxation of the cataract into the vitreous. In accordance with this principle, the grasp of the forceps is made small and as low as possible, and the lower zonule is ruptured by the combined action of hook and forceps, delivery being effected by tumbling. *M. Davidson.*

O'Brien, C S. **The cataract of postoperative tetany, with a report of three cases.** Arch. of Ophth., 1932, v. 7, Jan., pp. 71-96.

Cataract developing in presenile patients with a history of one or two thyroidectomy operations, especially with a history of tetany involving the upper extremities and occasionally other parts of the body, low blood pressure, reduced serum calcium associated with high blood phosphorus and, finally, signs of hyperexcitability of the peripheral nervous system, should always suggest tetany as the etiological factor. This paper reviews in some detail the history of forty-two cases reported in the literature, and to these adds three more operated upon by the author.

It is rather generally held that these cataracts are of a zonular nature, and, while that is to some extent true, slitlamp examinations have shown that the lens changes are not characteristic. The first changes seen with the slitlamp appear as fine opaque granules directly under the anterior and posterior capsules.

The author does not believe that spasm, toxins, or calcium deposits are responsible for the lens changes, but concedes that they may be the result of a deficiency of calcium and an increase in phosphorus in the aqueous, resulting from a change in the lens protein, or possibly from a change in the pH of the aqueous and vitreous, though alkalosis was at no time found in any of the author's cases.

Spontaneous hemorrhage occurred on the fifth day after operation in two of the three eyes operated upon by the author. Both cleared eventually, giving good results. This complication was also noted in a number of the reported cases, suggesting that before operation the patient should receive parathyroid hormone, visterol, and a high calcium intake. *M. H. Post.*

Pochissoff, N. **Modification of the conjunctival bridge in cataract operation, especially in eyes with hypertension.** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 90. (Ill.)

The incision commences 2 mm. above the horizontal meridian and ends in the conjunctiva with a large bridge which is enlarged in an oblique upward direction with scissors. *C. Zimmermann.*

Riehm, W. **Experiments on the problem of phaco-anaphylactic endophthalmitis.** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 62.

Subconjunctival and subcutaneous injections of lens substance from half-grown rabbits into rabbits never produced inflammatory reactions in the eyes, showing the fallacy of the conception that an anaphylactic endophthalmitis may develop from organ specificity of normal lens albumen.

C. Zimmermann.

Selinger, Elias. **An operative procedure for pyramidal cataract.** Arch. of Ophth., 1932, v. 7, Jan., pp. 109-112.

In this paper, operation upon a case of bilateral anterior pyramidal cataract is described. After wide dilatation of the pupil, a Ziegler knife was introduced at the limbus and passed through the lens cortex behind the fibrotic pyramidal mass. The knife was then withdrawn and a limbal incision about 8 mm. long was made, after which the cataractous mass was removed. In the first eye this was accomplished only after the mass had been turned so that its posterior surface became approximated to the posterior surface of the cornea. The mass was found very difficult to grasp, but was finally removed riding upon and between the curved blades of an iris forceps. In the second eye the extraction was easily accomplished with a sharp-toothed forceps. The lens cortex was rapidly absorbed, leaving not even a membrane behind. *M. H. Post.*

Sobhy Bey. **A contribution to the study of exfoliation of the lens capsule or glaucoma capsulocuticulare, with anatomical preparations.** Brit. Jour. Ophth., 1932, v. 16, Feb., p. 64.

This rare ailment is insidious and takes years for its development. Fully half of the cases tend to develop sooner or later chronic glaucoma, and its incidence represents 8.6 percent of chronic glaucoma. It is a senile degeneration of the lens capsule.

The edge of the pupil undergoes certain definite changes. Soon after the exfoliation of the lens capsule, isolated felt-masses, bluish-white in color, begin to appear, principally at the pupillary border, on or within the corrugated ring of the pigment cells of the back surface of the iris. Later on, this darkly pigmented ring at the edge of the pupil disappears slowly, either partially or totally. (Eleven microphotographs, twelve references, and a table of twenty-four cases are appended.)

D. F. Harbridge.

Weill, G. **Ectopia of the lens and general malformations.** Ann. d'Ocul., 1932, v. 169, Jan., pp. 21-44. (See Section 13, Eyeball and orbit.)

10. RETINA AND VITREOUS

Behr, C. **Another contribution to the pathology and pathogenesis of disciform degeneration of the posterior pole of the eye.** Zeit. f. Augenh., 1931, v. 75, Oct., p. 216.

The minute pathologic anatomy of a second case of disciform degeneration at the posterior pole is exhaustively described. The disease begins in the space between the lamina vitrea and the outer surface of the neuroepithelium. The changes in the retina itself are secondary. The essential changes are (1) transudation of an albuminous fluid between lamina vitrea and pigment epithelium, and (2) the following proliferative processes: proliferation and migration of the pigment epithelium, changes in the lamina elastica, production of an elastic tissue, and development of a fibrous-tissue mass whose vessels arise in the choriocapillaris. Behr offers a hypothetical explanation of the pathogenesis.

F. Herbert Haessler.

Bercioux, Noëlle. **Concerning the Lindner-Guist technique of the Gonin operation.** Ann. d'Ocul., 1932, v. 169, Jan., pp. 44-49.

The Gonin operation is a procedure provoking an adhesive chorioretinitis in the region occupied by the retinal tear. The Lindner-Guist technique accomplishes this effect by making a series of scleral trephinings in the position of the retinal detachment, the number of openings being varied according to the extent of the detachment and the number of tears. The trephine openings are touched with a caustic potash pencil, immediately neutralized with one-half percent acetic acid. The postoperative treatment is similar to that following thermopuncture. The method is especially suited to cases in which there are a number of retinal tears or where the tear is very large. A disadvantage is the great length of time required for the operation. *H. Rommel Hildreth.*

Boenheim, Felix. **Liver function in the Lawrence-Biedl syndrome.** Zeit. f. Augenh., 1932, v. 76, Jan., p. 156.

In three patients with retinitis pigmentosa the reaction to ingestion of levulose suggests hepatic dysfunction. The author draws no conclusions but presents his limited findings to stimulate study of the association between hepatic disease and retinitis pigmentosa.

F. Herbert Haessler.

Dymshitz, L. A. **Entopic observations on the action of miotics upon the retinal macula.** Russkii Opht. Jour., 1931, Aug., p. 30.

The author verified the entoptic observations of Hess (Archiv für Augenheilkunde, 1920, v. 86), relative to the toxic effect of miotics upon the foveal and parafoveal parts of the retina. In using the method of a "stenopeic aperture" he found that instillation of either pilocarpin or eserin produced a spasm of the retinal vessels, with resulting impairment of macular perception. Inhalations of amyl nitrate seemed to inhibit the angiospastic effect of miotics.

M. Beigelman.

Endelman, L. **Second and third cases of Oguchi's disease in Europe.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 798.

Endelman reports two cases of Oguchi's disease, which, excepting one case reported by Scheerer, has so far been observed exclusively in Japan. Both patients, brother and sister, children of consanguineous parents, suf-

fered from hemeralopia and presented identical opthalmoscopic aspects: very marked shot-silk reflexes, grayish-white discoloration of the fundus, dark, almost black, bloodvessels, which appeared in much greater number than usual, most likely due to contrast with the fundus and its reflexes. Otherwise the eyes were normal. In both cases Mizuo's phenomenon could be elicited, that is, after covering one eye for six hours a perfectly normal red fundus was observed. Anthropologically both patients were regarded as being of Armenoid type, a supposed derivative of the Mongolian type, and frequent in Jews.

C. Zimmermann.

Fringer, W. R. **Report of a case of recurrent hemorrhage into the vitreous.** (Eales' disease?) Illinois Med. Jour., 1931, v. 60, Dec., p. 499.

The author reports a case of recurrent hemorrhage into the vitreous in a young male, extending over a period of twenty-two years. The fundi had been examined before the hemorrhages started and showed chorioretinitis. There was a history of having been struck on the temple by a baseball some time previously, but the author does not believe this to be the cause of the hemorrhages. During the twenty-two years that the case was followed, there were five massive hemorrhages into the vitreous, all of which cleared up, leaving vision of 20/30. The fundus is now normal, except for some bands of choroidal atrophy and pigment proliferation and a small patch of retinitis proliferans. The treatment has consisted of potassium iodide by mouth, pilocarpin sweats, and inunctions of mercury. Protiodide of mercury and Blaud's pills were also prescribed. The author does not know the exact etiology, but believes that this case is of nontuberculous origin. (Discussion.)

M. E. Marcove.

Gallenga, Riccardo. **"Scintillatio nivea" of the vitreous in the anterior chamber, with particular reference to etiopathogenesis.** Arch. di Ottal., 1931, v. 38, July-Aug., p. 398.

The article contains an interesting case report of synchisis scintillans in which there was neither the synchisis (fluidity of the vitreous) nor the characteristic golden crystals floating in the liquefied vitreous.

The vitreous opacities are commonly snow-white in a nonfluid vitreous, a condition which Bachstez calls "scintillatio nivea corporis vitrei". Various theories are given in explanation of the pathology of this condition. The patient seen by the author presented the following peculiarities: Due to herniation of the vitreous, the snow-white flakes were found in the anterior chamber, moving freely in the aqueous. Some disturbance in the calcium metabolism, and changes in composition of the blood plasma, are supposed to be the underlying factors in this rare phenomenon. *David Alperin.*

Gonin, J. **Disinsertion of the retina.** Bull. Soc. Franç. d'Opht., 1930, p. 324.

Gonin discusses a type of retinal tear which is very frequently overlooked by the ophthalmologist. This type represents, not a dehiscence in the retinal tissue, but an actual tearing loose of the membrane along its line of insertion at the ora serrata. Of 240 cases of retinal detachment Gonin has noted this type in twenty-five, of which six have been bilateral. These disinsertions present certain interesting characteristics. They more frequently affect young men and nonmyopic subjects. The inferior or temporal regions are almost without exception the ones involved. When the disinsertion commences below, the detachment extends with relative slowness in the direction of the macula in such a manner that for a long time it escapes the attention of the subject himself. The absence of folds frequently leads the first examiner to make a diagnosis of retinal edema, or even retinal tuberculosis or flat tumor of the choroid. These inferior disinsertions may become stationary, the detachment stopping at a line of spontaneously formed chorioretinal adhesion. The temporal disinsertions have a tendency to result in more rapid detachment, with involvement of the macular region. They oc-

cur more frequently in older persons and have a much poorer prognosis.

The operative treatment consists in circumscribing the disinsertion with a line of chorioretinal cicatrices. Direct obturation by thermopuncture as in a simple tear cannot be practiced. The line of cicatrices should result in fixation of the retina at its position at the time of operation, and it can in no case result in reattachment of the retina to its original insertion. Quite often the first operation is followed by secondary tears and extension of the detachment to other parts of the retina. These complications are the more to be feared when the operation has been performed late in the disease. The author has obtained only four complete and three partial healings on fifteen cases attempted, which is a proportion decidedly inferior to that obtained on the other forms of detachment. As to etiology, Gonin suggests that many of these cases result from vitreous hemorrhages which may in turn be due to tuberculous alterations in the retinal veins.

Phillips Thygeson.

Hanssen, R. **The pathological anatomy of the vitreous.** Zeit. f. Augenh., 1931, v. 76, Dec., p. 77.

In four eyes with vitreous opacities the author examined the vitreous histologically and microchemically. Unfortunately slit-lamp observations were not recorded on these eyes. Calcium phosphate was probably a constituent of the tiny spherules found, while the carbonate was not. Tests for fatty acids were also positive. The chemical nature of a second form of fibrous opacity present in two of the eyes was not unequivocally determined.

F. Herbert Haessler.

Hartung, H. **On familial angioid pigment streaks of the fundus.** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 43. (Ill.)

With a review of the literature, the author reports the clinical histories of two brothers, aged forty-five and twenty-eight years, who presented the same typical angioid streaks of the fundus and pseudoxanthoma elasticum of the skin. With Marchesani and Wirz, Hartung assumes a degenerative process in certain parts of the elastic system. The consanguinity of the parents, the simultaneous and often familial and symmetrical changes of eye and skin, indicate the degenerative character of the affection. For the skin this has been confirmed by histological examination. Ophthalmoscopically the lesion starts in the elastic lamina vitrea of the choroid. The peculiar yellow discoloration of the fundus and the "drusen" of the hyaloid lamella, described by numerous observers, suggest extensive degeneration of the elastic lamella. Apparently swelling occurs with loss of elasticity and later shrinkage and ruptures, which after secondary pigmentation become visible as angioid streaks.

C. Zimmermann.

Hippel, E. **Angiomatosis retinæ and retinitis exsudativa (Coats). Pseudoglioma from tuberculosis.** Graefe's Arch., 1931, v. 127, p. 27.

The author reports the histologic findings in eight eyes sent him during the last year with the clinical diagnosis of glioma, in all of which the diagnosis was found to be wrong. The first eye from a boy four and one-half years old showed ophthalmoscopically large white glistening tumor-like prominences spread over a considerable part of the fundus. Anatomically, on the temporal side, there was a splitting of the retina into two leaves, beginning just behind the equator and extending forward to near the ora serrata. In the angle of the splitting nearest the disc there was a nodule chiefly composed of proliferation of capillary vessels. Lindau confirmed the opinion that this nodule should be designated as an hemangioblastoma. This case was diagnosed as one of Coats' retinitis.

The second eye was from a child three years old. A brother one year older had congenital lues and was an idiot. The retina had appeared partly detached and the fundus occupied by white areas. Anatomically the retina was found completely detached. Tremendous masses of swollen pigmented

epithelial cells had pushed their way into the outer layers of the retina and forced the retinal structures apart.

The third eye was from a four-year-old girl, and showed anatomically pronounced vascular changes only in the anterior part of the totally detached retina. Vessels occurred here with lumina almost as large as that of the central vein in the optic nerve. In the optic nerve trunk the central retinal vein was doubled for a short distance. These changes in the vessels were considered as due to a vascular maldevelopment.

The fourth eye was from an eight-year-old boy. With the ophthalmoscope grayish-white masses had been observed in the fundus. Anatomically, a cicatricial membrane was found behind the lens. In this case the pseudoglioma was tuberculous.

The fifth eye came from a boy four years old. A grayish-green reflex had been obtained over a wide area anteriorly in the lower nasal part of the fundus. Microscopically, from the summit of a retinal fold near the optic nerve, connective tissue extended forward to become inserted into a gray connective tissue mass upon the lower nasal side of the ciliary body. The most probable explanation for these changes was a metastatic inflammation in the vessels of the uvea and retina.

The sixth eye, from a two-year-old child, showed an abscess in the vitreous immediately behind the lens, causing total cordlike detachment of the retina. The basic condition must have been a metastatic suppuration. The seventh eye showed severe caseating tuberculosis of the choroid and retina with secondary glaucoma, in a two-year-old child. In the eighth eye, a severe disturbance had arisen from congenital lues. *H. D. Lamb.*

Jeandelize and Baudot. **The surgical treatment of retinal detachment.** Ann. d'Ocul., 1931, v. 168, Dec., pp. 961-972.

This is a statistical study of operated cases and an essay on the pathogenesis of retinal detachment. During two years forty-nine cases were studied, twenty-nine being suitable for and operated on by the technique of Gonin. The positive therapeutic results (cured and improved) were 70.8 percent.

The authors show a "schematic table of the possible pathogenesis of retinal detachment established on the mixed theory." This table classifies detachments into those without and those with tear of the retina. Descriptive subdivisions clarify their theory. They believe that there is a phase of exudation or transmutation in all detachments. This state rarely remains uncomplicated; most commonly there is a solution of continuity of the retina, determined by such causes as distention of the retinal pocket and the attraction of the vitreous. *H. Rommel Hildreth.*

Kleiber, G. **Albuminuric retinitis in juvenile arteriosclerosis with contracted kidneys.** Arch f. Augenh., 1932, v. 105, Jan., pp. 496-503.

Kleiber reports the case history of a fourteen-year-old-girl who had bilateral albuminuric retinitis. General examination showed albuminuria with generalized arteriosclerosis. The blood pressure was 200/180. Two months later, thrombosis of the central retinal vein developed in the right eye. The eye became glaucomatous and had to be enucleated. Nine months after the child was first seen, she died of uremic coma. Autopsy revealed chronic hemorrhagic nephritis with marked contraction of both kidneys. *Frederick C. Cordes.*

Koyanagi, Y. **The pathogenesis of pigmentary degeneration of the retina.** Graefe's Arch., 1931, v. 127, p. 1.

The author reports two cases of pigment degeneration of the retina in which the eyes were removed at autopsy and anatomically examined. The first case was that of a man showing ophthalmoscopically the typical picture of retinitis pigmentosa. For thirty-nine years before his death from apoplexy at sixty-seven years of age he had been troubled with hemeralopia. Two years before death, vision in the right eye was zero and in the left eye motion of the hand at 1 m. Anatomically, both enucleated eyeballs showed

the retina throughout strongly adherent to the underlying structures. The histologic changes in the retina corresponded entirely with those typical of retinitis pigmentosa. In the choroid, a considerable scarcity of bloodvessels was noted. All the choroidal arteries showed thickening, mostly from advanced sclerosis of the intima, with partial hyaline and fatty degeneration. The second case was that of a woman who died suddenly at seventy-four years of age from an aortic aneurism after having been totally blind for twenty years. No ophthalmoscopic examination had been made. Anatomically, in both eyes a relatively broad annular area of pigmentation extended entirely around the eyeball in the region of the equator. The choroid was generally poor in bloodvessels. The majority of the arteries showed considerable thickening of their walls, chiefly produced by proliferation of the intima with pronounced development of the elastica. The choriocapillaris had disappeared almost everywhere. This second case was primarily one of choroiditis syphilitica acquisita of Förster's type, the retinal involvement occurring under the typical picture of pigmentary degeneration but being due to disturbance of nutrition to the outer retinal layers.

Inhalations of amyl nitrite were used in five individuals afflicted for varying periods with pigmentary degeneration of the retina, to determine the effect upon the retinal and choroidal bloodvessels. In advanced cases of the disease no essential improvement in the condition could be observed from repeated inhalations of this drug. In early stages of retinal degeneration, however, retinal and choroidal bloodvessels reacted with an unmistakable dilatation to the amyl nitrite, and the functions of the retina, particularly dark adaptation, were almost definitely improved. The attenuation of retinal and choroidal arteries observed with the ophthalmoscope in the incipient stage of retinal degeneration is perhaps due to spastic contraction of these arteries. Persistent spastic contraction is attributable to disorders of internal secretion, either an increased supply of a suprarenin-like substance into the circulating blood or an abnormal increase of excitability of the vasoconstrictors.

H. D. Lamb.

Krakov, S. W. **The differences of sensitivity in the peripheral retina for twilight vision.** Graefe's Arch., 1931, v. 127, pt. 1, pp. 86-99. (See Section 3, Physiologic optics, refraction, and color vision.)

Lijo Pavia, J. **Alterations in the reflexes of the internal limiting membrane as early sign of poorly visible lesions.** Revista de Ophthalmologia de S. Paulo (Brazil), 1931, v. 1, Aug., pp. 83-90.

The author refers to his longer communication on the same subject, published in Annales d'Oculistique, 1931, volume, 168, April (See American Journal of Ophthalmology, 1931, volume 14, September, page 977); and he cites two case records to illustrate the importance of study of the reflexes at the macula, especially by means of retinal photographs obtained with the Nordenson-Zeiss apparatus. *W. H. Crisp.*

Lindner, K. **A contribution to the origin and treatment of idiopathic and traumatic detachment of the retina.** Graefe's Arch., 1931, v. 127, pp. 177-295.

Lindner's review of his cases with respect to the distribution of tears shows that most of these were in the region of the equator or even anterior to it. One or more defects were most frequently found in the upper temporal quadrant, and next in frequency was the lower temporal quadrant. Thus most tears occur in the temporal half of the fundus, as found by other writers. Guist's method of operating on the detached retina, now adopted in Lindner's clinic, is based on Gonin's procedure, but for this operation it is not necessary to find all the retinal tears. To Guist's method has been added Lindner's modification of systematically isolating the whole injured portion of the retina (demarcation method).

Lindner deems it premature to give statistics, but reports details of some twenty-seven cases operated upon during two months in the early summer. Good results were obtained in at least one-half, and among these cases there have been but two, so far, that showed recurrence. Lindner concludes with the statement that "this procedure may in future give place to a better, simpler method, obviating the necessity of multiple scleral trepanation, but it stands today as by far the most troublesome, time-consuming, and difficult operation in our specialty." *E. S. Buss.*

Mazzi, Lino. **Retinitis proliferans (Manz) due to recurrent hemorrhages in a tuberculous subject.** Arch. di Ottal., 1931, v. 38, May-June, p. 325.

The patient developed retinitis proliferans after retinal hemorrhages resulting from a slight contusion. A few years later the other eye had recurrent retinal hemorrhages with proliferations on the disc similar to those in the first eye. The author considers that tuberculous diathesis and lability of the venous system constitute a familial and hereditary predisposition to retinal hemorrhages and connective tissue proliferation in the ocular fundus.

David Alperin.

Meller, J. **The production of extensive adhesions between retina and choroid by means of endothermy.** Zeit. f. Augenh., 1931, v. 75, Oct., p. 207.

Ignipuncture produces a button of scar tissue as large as the optic disc. In twelve percent of Meller's cases the resulting shrinkage produced radial folding of the retina, and destroyed all hope of cure. It is practically useless to try to close large tears near the ora serrata. Sven Larsson has devised a procedure which results in widespread adhesion of retina to choroid. The sclera is laid bare by ample dissection of conjunctiva and Tenon's capsule, and one need not hesitate to temporarily detach one or even two muscles. Three or four trephine openings are made involving the whole thickness of the sclera or only its outer layers. The active electrode of an endothermy apparatus is applied, starting with a weak current, and increasing it (up to 500 milliamperes), constantly interrupting and reapplying the electrode, until it produces a dry brown spot. The subretinal fluid can be drained off through a trephine opening. Though more observation is needed before this method can be definitely evaluated, the author is very favorably impressed by his experience with it.

F. Herbert Haessler.

Pascheff. **Spontaneous healing in retinal detachment.** Bull. Soc. Franç. d'Opht., 1930, p. 334.

Pascheff describes five cases of retinal detachment, each having a different etiology, and in all of which healing occurred spontaneously. He believes that exudative choroiditis, though provoked by different factors, was the actual cause of detachment in each of the cases. In no case were retinal tears demonstrated, and the author states that he has many times noted retinal tears of traumatic origin without detachment of the retina. Also he has seen detachments with tears which have healed spontaneously. Nevertheless, he believes that retinal tears are complications which tend to diminish the chances of spontaneous healing.

Phillips Thygeson.

Poos, F. **Simultaneous occurrence of angioid streaks of the retina and pseudoxanthoma elasticum of the skin.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 734. (Ill.)

An otherwise healthy man, aged thirty-two years, presented in both eyes brownish-red anastomosing angioid streaks concentrically surrounding the optic disc, from which radiated a system of stripes accompanied, especially in the right eye, by margins of light. The retinal vessels crossed over all the streaks. The whole posterior portion of the fundus had a grayish-red hue in comparison to the periphery. With the exception of small paracentral whitish foci in the right eye the retinal centers

were intact and both eyes normal. Vision with +1 sph. was normal.

On both sides of the neck at the region of the sternocleidomastoid muscles were slightly elevated yellowish-brown areas. Excised pieces showed typical microscopic destruction of the elastic tissue (elastoclasis). This coincidence of angioid streaks of the retina with pseudoxanthoma elasticum of the skin was confirmed in all systematically examined cases. As both affections may be of familial occurrence, a constitutional inferiority of the elastic substance of the body in the sense of a systemic disease was assumed. The participation of the eyes through concomitant brittleness of the elastic lamina leads to interpretation of the genesis of the primary angioid streaks upon the basis of ruptures and dehiscences under the mechanical influence of intraocular pressure, explaining the frequently observed hemorrhages. It is a chronic progressive disease which in severe cases may entail loss of central vision and practical blindness, against which therapy is without avail.

C. Zimmermann.

Reichling, W. **Retinal detachment following traumatic choroidal hemorrhage.** Arch. f. Augenh., 1932, v. 105, Jan., pp. 459-495.

Reichling reports two cases of retinal detachment following traumatic choroidal hemorrhage. The first patient, a man of twenty-one years, received a blow to the right eye from an ice hockey stick. Twelve hours after injury, there was detachment of the retina, with an elevation of five diopters, involving the area between the superior and inferior temporal vessels. In the fovea was a cherry-red spot. Below this there was a large choroidal hemorrhage that completely masked a choroidal tear. During the course of the following nine months, absorption of the hemorrhage and reattachment of the retina took place with partial restoration of central vision. At the last examination, the fundus showed some fine macular pigmentation and the scar of the retinal tear.

In the second case, a similar picture was present following a blow to the eye during a boxing contest. The course and final picture were similar to those of the first case except for more rapid absorption. Only one similar case has been reported in the literature. The author also discusses the possible source of the macular pigment.

Frederick C. Cordes.

Salus, Robert. **Electrocoagulation for operation on detachment of the retina, also a contribution for experimental creation of holes in the retina with detachment.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 752.

Salus reports his attempts at surgical diathermy instead of thermocauterization for operation of detachment of the retina. Therapeutically they were entirely negative. All three cases showed impairment and such serious damages (hemorrhages in the vitreous, holes in the retina), that further applications of electrocoagulation must be discarded.

The method, however, showed the possibility of experimental creation of holes in the retina with detachment, as the author proved in animals. This opens the prospect of possible solution of the etiology, by favoring the view that the formation of holes is primary and the cause of detachment.

C. Zimmermann.

Soriango, Francisco. **Pathology of the vitreous.** Boletin de Informacion Oft., 1931, Nov.-Dec., p. 299.

This is a very elaborate review of the pathology found in most affections of the vitreous. The slitlamp findings are emphasized, especially as to differential diagnosis. Due importance is given to early slitlamp findings in the vitreous, in arteriosclerosis, tuberculosis, and sympathetic ophthalmia.

The author includes a detailed presentation of vitreous changes with glaucoma, foreign bodies, intraocular tumors, retinitis pigmentosa, choroiditis, cyclitis, hemorrhage, purulent infections, detachment of the retina, loss of vitreous, parasites, and certain congenital anomalies. *Hugo Lucic.*

Sourdille, Gilbert. **Clinical evolution of detachments of the retina.** Bull. Soc. Franç. d'Opht., 1930, p. 342.

Sourdille concludes that the diffuse vitreous clouding which frequently appears at the onset of a retinal detachment is of only temporary nature and should not be considered as a contra-indication to operation. It disappears after some days or weeks, thus demonstrating that it is not due to a profound degeneration of the vitreous incompatible with later amelioration, but to a transitory phenomenon, perhaps of a physico-chemical order, provoked by mixture of subretinal and vitreous fluids after a rupture of the retina.

Spontaneous detachments, whatever be their ultimate location, originate from initial detachments at the level of the upper portion of the retina, most frequently in the upper external part. The final detachment is only an extension, a generalization, or a migration of this original focus. Surgical treatment should then always commence with a puncture in the superior or supero-external region, as attention to the primary focus frequently results in reattachment of the parts secondarily involved.

Retinal tears may appear early or late, may be single or multiple, but always indicate more or less considerable alteration of the retina. They always appear after detachment and do not play the capital rôle ascribed by the Lausanne school. However, they are of interest since they frequently, though not always, indicate the site of initial detachment.

Examination of the healthy eye of a patient having retinal detachment frequently reveals a pre-equatorial choroiditis in ring- or band-like arrangement, parallel to the equator and involving most often the superior part of the choroid. This may serve to explain the primary localization of the detachments. *Phillips Thygeson.*

Stein, Richard. **Experiences with the Gonin operation in detachment of the retina.** Arch. f. Augenh., 1932, v. 105, pp. 290-367.

Stein reviews eighty cases of detachment of the retina, seen in Elschnig's clinic and operated upon by the Gonin operation. In seventy-five percent of the cases, one or more retinal tears were found. In recent cases the tear was almost always present while in the older cases it was probably masked. The tears were localized according to the method devised by Gonin, and the operation was carried out according to Gonin's technique with the Paquelin cautery. In sixty cases in each of which a tear was found, twenty percent had complete reattachment. Excluding cases of over three months' duration and those with multiple tears or retinal degeneration, the percentage of successful results increased to fifty. With the same types of cases excluded in the spontaneous myopic and senile group, reattachment took place in thirty percent of the operated patients. Failures are in part the result of incorrect localization of the tear or faulty operative technique. Another factor is failure, due to the great stretching, to obtain complete closure of the tear. The development of new tears, particularly in the presence of marked retinal degeneration, also plays a part, as do certain operative risks associated with the procedure. The prognosis depends upon the duration, number, and size of tears, and the condition of the retina. Traumatic detachments due to contusions have the best prognosis. Only in cases of less than three months' duration can one expect an anatomical and functional result. There are certain dangers associated with the procedure. Hemorrhage, shrinking of the retina, and the possibility of losing the remaining vision through complete detachment must be considered especially in a monocular patient. Where the detachment is stationary and its edge appears to be bound down and vision is relatively good, ignipuncture is contra-indicated in monocular patients. However, where the detachment is progressive, operation must not be delayed too long. Of the twenty cases in which no tear was found, recovery took place in only one patient. This emphasizes the

necessity of finding and carefully localizing the tears. In spontaneous detachments, myopia and senility are the commonest etiological factors. The author also gives in detail the technique of localization of the tears and the operative procedure as used in Elschnig's clinic. *Frederick C. Cordes.*

Stokes, W H . **Unusual retinal vascular changes in injury of the chest.** Arch. of Ophth., 1932, v. 7, Jan., pp. 101-108.

Angiopathia retinæ traumatica is the name given by Purtscher to certain fundus changes due to severe injury, usually of the head. The picture is characterized by the appearance of extravasated lymph in the retinal tissues. One case of such injury is reported, and the literature is reviewed. The changes in the retina are not due to direct injury to the eyeball, but rather to contusion of the skull, though lesions of similar appearance have followed compression injuries to the chest. They are undoubtedly the result of a sudden increase of intracranial pressure.

On examination the vitreous is found hazy, the disc slightly blurred, the arteries contracted, and the veins full and congested. Along the course of the veins are seen many discrete whitish patches with round borders. Among these patches and underlying them are many hemorrhages of varying size and shape, apparently lying at different depths in the retinal tissue. The vision is frequently reduced to shadows, which loss may prove temporary or permanent as the lesion is more or less extensive. The author believes that the whitish spots are probably due to escape of lymph from the perivascular lymph spaces. *M. H. Post.*

Tirelli, Gaspare. **A case report of occlusion of the central retinal artery.** Arch. di Ottal., 1931, v. 38, May-June, p. 227.

The author, after describing the common clinical picture found in retinal occlusion, emphasizes the fact that the condition should not be treated as an ocular disease, but as a syndrome of some systemic disease, and the treatment should therefore be directed to systemic causes such as toxic conditions, syphilis, and disturbances of metabolism. *David Alperin.*

Vancea, P. **The significance of retinal tension in ocular pathologies.** Graefe's Arch., 1931, v. 126, pt. 4, pp. 601-612.

The symptom complex of retinal circulatory instability occurs in the neurotic, and in those suffering from anxiety and emotional excitability, and its cause is found in an organo-vegetative dystony (amphotony). It is constant in epileptics and frequently occurs after spinal puncture.

E. S. Buss.

Wagner, H. **Determination of linear measurements upon the surface of the eyeball.** Graefe's Arch., 1931, v. 127, pt. 1, pp. 103-136.

Since the introduction of Gonin's operation for retinal detachment, it has become more important to have exact knowledge of the distance from ora serrata to limbus and also of posterior pole and papilla from limbus, to correlate these measurements with the length of ocular axis, and if possible with the total refraction of the eye. The exact site of the ora serrata can be determined intra vitam by means of diascleral transillumination, having been found to coincide, both temporally and nasally, with the dark ring that lies several millimeters equatorially from the ciliary body. Nasally it is 0.5 mm. closer to the limbus than elsewhere; while temporally, above, and below the distances are about equal. The distance of the ora serrata from the limbus is dependent upon the length of the ocular axis: the longer the axis the greater the distance between ora serrata and limbus, and vice versa; hence in eyes having a myopic axis this distance is greater than in emmetropic and hyperopic eyes.

With the sagittal axes measuring 24.0 to 25.8 mm., the average circumferential distance from posterior pole to limbus was 32.6 mm., that from papilla to limbus nasally was 28.6 mm., and

temporally, 35.2. When the length of the axis was 22.7 to 23.9 mm., the distance between posterior pole and limbus averaged 30.7 mm.; that from papilla to limbus averaged nasally 27.2 mm., and temporally 33.8 mm. The papilla lies 6 to 8 mm. closer to the limbus on the nasal than on the temporal side; above and below the distance from papilla to limbus is about the same, measuring about the average of nasal and temporal distances from papilla to limbus.

The correlation of corneal refraction with these measurements is given in a table recording the data on eighteen cases. *E. S. Buss.*

Weiss, Edward. **Cerebral adiposity with mental deficiency and retinitis pigmentosa: the Laurence-Biedl syndrome.** Endocrinology, 1931, v. 15, Sept.-Oct., p. 435.

The literature is reviewed and a case of Laurence-Biedl syndrome is described. In this condition there is a congenital and familial cerebral adiposity associated with mental deficiency, genital dystrophy, retinitis pigmentosa, and frequently polydactylism. The case described is that of a girl fifteen years old, who at the age of four years, following an acute illness, developed convergent squint and the general symptoms of pituitary disturbance. Examination of the eyes disclosed partial paralysis of the external rectus of each eye, with retinitis pigmentosa.

The development of the syndrome was formerly thought to be due to a disorder of the pituitary gland, but recently the tendency has been to regard a lesion of certain metabolic centers in the floor of the midbrain as the cause. Treatment with glandular extracts, chiefly thyroid and pituitary, has brought improvement in some cases, including the case here recorded.

M. E. Marcove.

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Bronfenbrenner, A. N. **Oxycephaly as a pathogenetic entity.** Amer. Jour. Dis. Child., 1931, v. 42, Oct., p. 837.

The author reviews the literature and studies a series of clinical cases of oxycephaly.

Optic atrophy has been considered as being pathognomonic of this condition, but the author believes it is not an essential characteristic. The optic atrophy is usually secondary to choked disc. It was formerly thought that the choking was due to narrowing of the optic foramen, but the author states that choking has been present where no stenosis of the foramen was found post mortem. *M. E. Marcove.*

Elkes, G. **A contribution to the etiology of retrobulbar neuritis.** Zeit. f. Augenh., 1931, v. 75, Oct., p. 271.

After a brief discussion of opinions on the etiology of retrobulbar neuritis as stated in the literature, the author concludes that we have no completely satisfactory explanation of this disease. Among the cases of acute retrobulbar neuritis which occurred in the Königsberg clinic in recent years, eleven were accompanied by clinically demonstrable disease of the paranasal sinuses.

F. Herbert Haessler.

Junius, Paul. **Diagnosis of brain tumors, with particular emphasis on ophthalmological signs.** Zent. f. d. ges. Ophth. u. i. Grenzgebiete, 1931, v. 26, pp. 273-313.

Junius has prepared an excellent outline on the diagnosis of the various types of brain tumor, with particular emphasis upon ophthalmological signs. He gives illustrative cases and reviews the recent literature. The differential diagnosis between brain tumors and lues, encephalitis, and other conditions, is also discussed, especially as to the value of x-ray in diagnosis and therapy. Several paragraphs are devoted to the incidence and surgery of brain tumors. This résumé of the subject does not lend itself to abstracting.

Frederick C. Cordes.

Mahoney, William. **Retrobulbar neuritis due to thallium poisoning from depilatory cream.** Jour. Amer. Med. Assoc., 1932, v. 98, Feb. 20, p. 618.

Mahoney reports three cases of retrobulbar neuritis due to thallium poisoning following the prolonged use of Koremlu depilatory cream. Alopecia and peripheral neuritis were also present. The three patients entered a neurosurgical clinic as intracranial tumor suspects. Vision was improved by discontinuing the employment of the depilatory cream. The literature is reviewed. (Three visual fields.)

George H. Stine.

Salvati, G. **Optic neuromyelitis.** Arch. di Ottal., 1931, v. 38, May-June, p. 310.

The etiology of this disease is obscure, and lues, tuberculosis, nephritis, alcoholism, neuropathic heredity, secondary anemia, and hematogenous toxemia are given as causes by different clinicians. We have clinically a bilateral optic neuritis occurring suddenly while the patient is apparently in good health, followed in a short time by excruciating orbital pain. Usually the neuritis is manifested by a papillitis, and often there are no ophthalmoscopic findings pointing to a retrobulbar neuritis; rarely do we find choked disc. We may have a central scotoma, diminished vision with constricted fields for form and color blindness within twenty-four hours. The pathological anatomy is that of a diffuse encephalitis. Involvement of the optic tracts and chiasm gives characteristic hemianopsias. *David Alperin.*

Schweinitz, G E. de. **Blindness and papilledema in Guernsey calves, usually bulls.** Arch. of Ophth., 1932, v. 7, Jan., pp. 1-17.

This paper is based on personal examination by the author of five animals blind from papilledema and optic atrophy. The disease exhibits a predilection for Guernsey bulls, several frequently being affected in one herd. Occasional cases in females have also been observed. It appears to depend largely upon inbreeding. Blindness is permanent, resulting from papilledema with consequent destruction of the ganglion cells of the retina and extensive degeneration of the optic nerve apparatus up to and including the chiasm. Food poisoning has been pointed out as a possible etiological factor, Delez having produced the lesions in twelve calves fed on corn-distiller's grain, corn gluten, cotton-seed meal and wheat straw, and for two months adding alfalfa hay and corn silage. In most of these cases blindness occurred suddenly, though in a few instances it came on gradually. The lesions probably have their beginning in prenatal life, as some animals have been found blind on the fourth day, while others appear to have been born blind.

M. H. Post.

Seale, E. A. **Salvarsan and optic atrophy.** Jour. of Med. Assoc. of South Africa, 1931, v. 5, Aug., p. 528.

A man fifty-four years old complained of sudden failure of vision which had been present for three weeks. Thirty years ago he had had a full year's treatment with salvarsan, and was pronounced cured. He had just completed a course of four intravenous injections at weekly intervals. Examination revealed a bilateral primary optic atrophy. The author suggests that the discs should be carefully examined before such treatment is given and that one should be cautious with the initial dose. If the appearance of the discs is at all suspicious, mercury should be substituted.

M. E. Marcove.

Sørenson, Einar. **Tumor in the chiasmal region, with left-sided optic atrophy and right-sided choked disc.** Hospitalstidende, 1932, v. 75, Jan. 14, pp. 185-190.

An unmarried woman, fifty years of age, was brought to the hospital on account of loss of vision of both eyes, with headaches and vomiting. The vision of the left eye had begun to fail twenty-five years before and had become progressively worse. Three months previously she had had a sudden attack of headache, nausea, and vomiting which lasted for several days. One month earlier a similar attack had occurred during which she first noticed reduced vision

of the right eye. Roentgen films revealed an almost total destruction of the sella with complete absence of the posterior processes. The vision was limited to recognition of light in each eye. The left disc presented typical optic atrophy. The right disc was grayish in color, and showed an elevation of three diopters. The veins were moderately filled and the arteries were somewhat contracted; there were minute hemorrhages in the disc and along the vessels, but no exudate. The diagnosis of a chiasmal tumor seemed evident.

The tumor probably first caused atrophy of the left tract by pressure. Later on, increased intracranial pressure brought about choked disc in the right eye, but the like effect was lacking in the left because of the direct pressure on the left tract.

D. L. Tilderquist.

White, J. J. **Toxic amblyopia.** United States Naval Med. Bull., 1931, v. 29, Oct., p. 614.

The author discusses the differential diagnosis between toxic amblyopia and retrobulbar neuritis. In toxic amblyopia the pathology is located in the ganglion cells of the retina, which show vacuolation and breaking up of the Nissl granules. This is emphasized in the maculopapillar bundle because the ganglion cells are most highly differentiated there.

M. E. Marcove.

12. VISUAL TRACTS AND CENTERS

Aguiar, Paulo de. **Ocular disturbances of hypophyseal origin, hypophyseal tumor; treatment with deep radiotherapy.** Revista de Ophthalmologia de S. Paulo (Brazil), 1931, v. 1, no. 1, pp. 7-15.

A man of forty-one years complained of progressive loss of vision, more marked in the right eye, and severe headaches which interfered with sleep. There was general adiposity, with relative sexual impotence. The vision of the right eye was 1/10, that of the left eye 2/3. There was a large inferotemporal scotoma in the right visual field, and a beginning temporal scotoma in the left field. X-ray examination showed disappearance of the posterior and superior boundaries of the sella turcica, absorption of the posterior clinoid processes, excavation of the floor of the sella, and greater opacity of the right than of the left orbit. Deep x-ray therapy relieved the headaches, but the vision continued to diminish. A rhinologist advised that the sphenoidal sinus was occupied by the tumor mass, and advised a Hirsch operation. Persistent use of deep x-ray therapy was advised by the author. The patient, who was an Italian living in Brazil, went to his native country for further treatment. Angelucci of Naples confirmed the diagnosis and the recommendation as to x-ray therapy, and the patient returned to Brazil for continued treatment. Between June, 1926, and February, 1931, the vision improved from right counting fingers at 2.5 meters and left counting fingers at 5 meters to right 1/8 and left 2/3; the greatly contracted visual fields showed a marked recovery; and the patient remained free from headache, nausea, and dizziness.

W. H. Crisp.

Fischer, Franz. **Enlarged hypophysis in pregnancy as the cause of bitemporal hemianopsia.** Zeit. f. Augenh., 1931, v. 75, Nov., p. 343.

In the opinion of many ophthalmologists bitemporal hemianopsia occurs in seventy to ninety percent of all pregnant women. Many others completely deny its occurrence.

The author observed a pregnant woman with amaurosis in the right eye and field defects suggestive of hypophyseal enlargement. Later the vision of the left eye was reduced to counting fingers, and in each eye the field was reduced to a small quadrant in each upper nasal quadrant. Post partum the eyes returned to normal. The cause doubtless was an enlarged hypophysis, but in this instance we are dealing with unusual conditions which are not common to all parturients.

F. Herbert Haessler.

Fonseca, Aureliano. **Hysterical blindness.** Revista de Opthalmologia de S. Paulo (Brazil), 1931, v. 1, Nov., pp. 174-176.

In a woman of nineteen years, complete bilateral blindness of hysterical origin was at first diagnosed as due to multiple sclerosis. The right eye had a large central plaque of atrophic chorioretinitis, and the disc was pale. After recovery, the right eye counted fingers at five centimeters, while the left eye had full normal vision. *W. H. Crisp.*

Vampré, E. **Hemianopsia from lesion probably of the sylvian (middle cerebral) artery in its superior and posterior course. Differential diagnosis from lesions of the posterior cerebral artery.** Revista de Ophthalmologia de S. Paulo (Brazil), 1931, v. 1, Aug., pp. 91-99.

A man of twenty-eight years developed a right hemiparesis more marked in the face, with Broca's aphasia and Wernicke's sign, loss of speech, word deafness including loss of understanding of what was said to him, inability to respond to a command, verbal blindness with inability to read, agraphia, and ideomotor apraxia for the movements of closing the eyes and opening the mouth. Recovery was complete except that the right homolateral hemianopsia persisted, without the hemioptic reaction of Wernicke. The author assumes that the patient had a hemorrhage in the region of a terminal branch of the middle cerebral artery (which he calls in Portuguese the artery of "double curve", an expression for which the abstracter has not been able to find a definite translation). The three last branches of the middle cerebral artery, deep in the fissure of Sylvius, contribute to the blood supply of the optic tracts. *W. H. Crisp.*

Vidaur, M. **On tumors of Rathke's pouch.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, Jan., p. 1.

In a woman of twenty-five years a diagnosis of tumor of Rathke's pouch was made without surgical exploration, on the basis of amenorrhea of seven years duration, polydipsia, polyuria, narcolepsia, headaches, vomiting, left-sided primary optic atrophy, right-sided upper nasal optic atrophy, bitemporal hemianopsia, erosion of the sella, and suprasellar calcified bodies. The literature of suprasellar and intrasellar tumors is reviewed in this connection; diagnosis and therapy, according to Cushing, are outlined and illustrated, uselessness and harmfulness of x-ray treatment are pointed out, and the difficulties of differential diagnosis from aneurism of the internal carotid and the circle of Willis, from circumscribed chronic basal arachnoiditis of traumatic, luetic, and other origin, are discussed. *M. Davidson.*

13. EYEBALL AND ORBIT

Bardanzello, T., and Vallebona, U. **A case of monocular pulsating exophthalmos.** Arch. di Ottal., 1931, v. 38, May-June, p. 342.

A case of traumatic pulsating exophthalmos is reported, in which ligation of the common carotid artery resulted in cure. *David Alperin.*

Fischer, Franz. **The differentiation of the mesodermal coats of the eyecup; the development of cornea, anterior chamber, and pupillary membrane in man.** Graefe's Arch., 1931, v. 126, p. 504.

In this study were used serial sections of almost one hundred human embryos from the collection of the embryological institute of the University of Vienna. In early stages in the development of human embryos, the mesodermal cells in the immediate vicinity of the optic vesicle differ from the other cells of the cephalic mesoderm by a denser approximation and by an arrangement concentric to the optic vesicle. The bloodvessels running in the inner layers of this mesodermal zone are the anlage of the choroidal vessels. Later, part of the cells of the mesoderm lie so thickly together that they form a zone between the mesodermal coats of the eyecup and the head mesoderm. This intermediate zone is the anlage of Tenon's capsule; it may be called the outer mesodermal zone. From the inner mesodermal zone lying in apposition to the optic cup come the uvea, the sclera, and the periocular connective tissue. After the anterior part of

the sclera has begun to develop, there gradually forms from the middle toward the margin of the corneal anlage a one-layer, endothelium-like stratum of mesodermal cells—the corneal endothelium. The findings of the author are essentially analogous to those of Seefelder (and, the abstracter would point out, to those of Mann).

H. D. Lamb.

Hoffman, Wolfgang. **The value of roentgenograms in diseases of the orbit.** Zeit. f. Augenh., 1931, v. 75, Oct., p. 243.

Since roentgenograms have been improved greatly by the use of Bucky's diaphragm, soft tubes, and contrast plates developed in solutions that increase the contrast, it is possible to get real help from them in the diagnosis of orbital lesions. In each of seven cases of orbital lesion (four of tumor, one of fracture, one of angioma, and one of cyst in the muscle cone), the films were indispensable for exact diagnosis.

F. Herbert Haessler.

Menninger-Lerchenthal, E. **Congenital anophthalmos, a prenatally marked child.** Graefe's Arch., 1931, v. 127, pt. 1, pp. 163-176.

According to Rohleder, prenatal marking is based upon an unpleasant sense impression that leaves an imprint upon the outer form of the offspring.

An unmarried primipara, aged twenty-three years, had lived in her sister's home until the seventh month of pregnancy. The sister, aged thirty-eight years, had had at birth an eye disease which resulted in loss of vision in the left eye. When she was seven years old this eye became purulent and was enucleated. She did not wear a prothesis.

The young mother gave birth to a healthy male child in whom the left eyeball was missing, a case of true anophthalmos with ankyblepharon and well developed adnexa, not a cyclops. The ocular cavity, eyebrows, and eyelids were entirely normal and equal to those on the other side. Palpation of the left lids gave no indication of cystic or other abnormal formation.

The family history is entirely free from reports of ocular involvement of any kind among numerous siblings. Hence no hereditary taint would come into consideration; nor were the sisters hysterical or neuropathic.

E. S. Buss.

Remky, E. **Osteomyelitis of the maxillary bone in an infant.** Zeit. f. Augenh., 1931, v. 75, Oct., p. 240.

In an infant with a large swelling about the eye, associated with exophthalmos and discharge of pus into nose and mouth, the cause was osteomyelitis of the maxilla. After incision and curettage the lesion healed. It was probably secondary to an abscess in the region of an unerupted tooth. Only very careful study makes possible diagnostic differentiation from phlegmon of the tear sac. *F. Herbert Haessler.*

Shcheglova, A. A. **Orbital cellulitis in infectious diseases.** Russkii Opht. Jour., 1931, Aug., p. 127.

The author reports six cases of orbital cellulitis following acute infectious diseases: influenza, scarlet fever, and erysipelas. In four of them a simultaneous affection of the accessory nasal sinuses was found. Surgical drainage was resorted to in three cases, while the others were treated in a conservative manner. The mortality (sixty-six percent) was equally high in both groups.

On pathologic examination of the author's material two types of orbital cellulitis were differentiated—with and without venous thrombosis.

M. Beigelman.

Smith, J. A. **Voluntary propulsion of both eyeballs.** Jour. Amer. Med. Assoc., 1932, v. 98, Jan. 30, p. 398.

A young negro boy could voluntarily produce marked exophthalmos of either eye or both. The eyes and eye movements were otherwise perfectly normal. Visual acuity has so far been unaffected. A similar case was reported by Ferrer in 1928. (Four photographs.) *George H. Stine.*

Sondermann, R. **The developmental-mechanical construction of the human eye in the early months of fetal life.** Graefe's Arch., 1931, v. 127, pp. 347-357.

(Author's summary.) The origin of the optic-cup fissure is due to a dependent differentiation in which the hyaloid artery plays a decisive rôle. The thickening of the mesodermal layer of fibers in the anterior ocular pole and the arching of the cornea are chiefly brought about by the pressure exerted by the growing lens.

E. S. Buss.

Stone, L. S. and Cole, C. H. **Grafting of larval and adult eyes in amblystoma punctatum.** Soc. Exper. Biol. and Med., 1931, v. 29, Nov., p. 176.

The authors report their studies in transplantation of eyes of Amblystoma punctatum, and compare the larval and the adult grafts. One hundred and ninety-three larval grafts on larval hosts and one hundred and two adult grafts on adult hosts were studied daily for many months. Return of circulation after operation was obtained in forty percent of the old adults and in eighty percent of the younger adults. The earliest return in larvæ was eighteen hours. One-third of the adult and most of the larval eyes showed no corneal or lenticular opacities. In a few cases the opacity was transient. In the iris of adult grafts, changes were dependent upon the early return of circulation. In the larval eye there was occasionally a slight temporary dulling of the luster of the iris. This usually occurred during the first few weeks.

There was a slight postoperative reduction in the size of both adult and larval grafts. In the growing larval eye the reduction was more marked until circulation returned, and by the twentieth day the graft was usually of normal size. In the adult, the size reduction was usually permanently established in a month. In adult grafts, myosis was noted in some cases immediately after operation and persisted about a week. In the larval form, either myosis or mydriasis occurred, but the condition lasted only a few days. In many cases there was no change in the pupil.

The retinal change in the larval form is confined to a permanent loss of varying amounts of inner ganglion cells during the short period when the graft is decreasing in size. In the adult form, there is a vast degeneration of all the layers of the retina extending to the ciliary margins. This takes place during the first twenty-five days. By about the thirty-seventh day in young adults, all the layers of the retina are rapidly regenerating, partly from the ciliary margin and partly from the islands of undegenerated retinal cells. In old adults, the process is retarded from one to three weeks.

In the older forms, the degeneration of the optic nerve accompanies that of the retina. With the restoration of the retina, the new optic nerve develops to about normal size, and reaches the chiasm in a tortuous manner. In the larvæ complete degeneration of the optic nerve takes place during the first week although the retinal change is slight compared with the adult grafts. By the end of the third week, it is usually regenerated and less than normal in size, and is also tortuous.

Return of vision in the young adult eye was rapid and was proved by the thirty-eighth day. In older adults, it usually occurred after the second month. In larvæ the earliest test for vision with positive results was on the forty-eighth day.

M. E. Marcove.

Wegener, W., and Lammerhirt, F. G. **Plethysmographic studies on the pulsation in the eyeball.** Zeit. f. Augenh., 1931, v. 75, Nov., p. 317.

By applying a plethysmograph to the eye a graphic record is obtained which in all details greatly resembles the pulse picture of large arteries. The best curves are obtained from subjects in middle life. In the younger and older groups the curves are particularly rich in variations for which no adequate explanation is found.

F. Herbert Haessler.

Weill, G. **Ectopia of the lens and general malformations.** Ann. d'Ocul., 1932, v. 169, Jan., pp. 21-44.

The author reports eight cases in which ocular malformations were found associated with arachnodactyly, a rare form of gigantism demonstrating besides hand and foot anomalies a variety of other skeletal defects, and muscular, adipose and tendon anomalies. Dwarfism was also found in the series, as well as other rare general malformations. The ocular anomalies included ectopia of the lens, coloboma of the iris and lens, calcification of the lens, and extreme miosis not responding to mydriatrics, and accompanied by pronounced iris atrophy. (Case records and roentgenographs.) *H. Rommel Hildreth.*

14. EYELIDS AND LACRIMAL APPARATUS

Collins, E. T. **The physiology of weeping.** Brit. Jour. Ophth., 1932, v. 16, Jan., p. 1.

This communication does not lend itself well to abstract. The essayist quotes freely from the work of many investigators. He discusses the differences between reflex and emotional lacrimal secretion. The human is probably the only mammal that weeps. Infants do not weep until they are several weeks old. Due to lysozyme in the lacrimal secretion tears have a marked protective influence. While new-born infants do not weep, yet the lacrimal glands are well developed and capable of secreting in response to irritation. It is very likely that in the use of Credé's treatment the silver salt merely acts as the irritant increasing the antibacterial lysozyme which is the potent factor. *D. F. Harbridge.*

Feigenbaum, A. **Supernumerary lacrimal caruncle.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 760. (Ill.)

Two cases of supernumerary lacrimal caruncle at the lower lid, in persons aged twenty-six and twenty years, are reported. In the first case the supernumerary structure was cut off and anatomical examination proved its character. In a third patient, a man aged thirty-nine years, the anomalous formation was in the upper lid, displacing the lacrimal punctum outward. It was more doubtful, as anatomically it showed the structure of modified sweat or lacrimal glands. *C. Zimmermann.*

Fleischer, Bruno. **Molluscum contagiosum of the lids of unusual shape.** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 23. (Ill.)

Fleischer describes and illustrates molluscum contagiosum occurring in a woman of sixty-four years, along the border of the upper lids and the intermarginal space in the form of whitish wart-like formations indented at the centers. There was chronic conjunctivitis. After curetting, excision, and rubbing with twenty percent carbolic acid in alcohol the lumps disappeared entirely. *C. Zimmermann.*

Fonseca, Aureliano. **Oculopalpebral sporotrichosis.** Revista de Ophthalmologia de S. Paulo (Brazil), 1931, v. 1, no. 1, pp. 33-36.

A young Brazilian woman of seventeen years, unmarried, came to the clinic on account of a recent growth on the left lower palpebral border. Inspection showed an inflammatory, purulent swelling lying along the palpebral margin, measuring 35 mm. in length by 3 mm. in width at the inner extremity and 10 mm. at the outer extremity. A culture in Sabouraud's medium was positive for sporotrichum Beurmanni-Gougeroti. Treatment with iodide of potash produced a cure after three months. The author suggests that in the presence of nodules or gummatous ulcerations the ophthalmologist should remember the possibility of sporotrichosis; and that ophthalmic textbooks should give more prominence to this disease, which probably is sometimes confused with tuberculosis or syphilis. *W. H. Crisp.*

Gillessen, P. **Treatment of acute and chronic blepharoconjunctivitis with cerophthol (Hahn).** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 92.

Gillessen reports very satisfactory and permanent results with cerophthol,

a salve consisting of bee wax, finely precipitated mercury, and acetate of lead and dispensed in a tube.

C. Zimmermann.

Houwer, A. W. **Cysts of the fornix conjunctiva and epitarsus.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 721. (Ill.) (See Section 5, Conjunctiva.)

Kalt, E., and Kalt, M. **Latent infections of the lacrimal passages.** Ann. d'Ocul., 1932, v. 169, Jan., pp. 1-21.

The authors feel that the results of their researches explain the inflammatory complications seen after intraocular surgery in which irreproachable aseptic precautions have been taken. Their work, a clinical and pathological study, demonstrates an inflammatory condition of the canaliculi and upper part of the sac which they term follicular stenosing dacryocystitis. As the name suggests, follicles form and by their presence the lumen is narrowed. Usually this starts in the region of the junction of the canaliculi and the sac. The etiology is believed to be infection, on suitable soil, arising in the conjunctiva, and distinct from the dacryocystitis of the ascending type secondary to nasal disease.

The cases were chiefly in old people with cataract. The most common symptom was tearing. A variable loss of permeability to irrigation is a helpful point in the diagnosis, but the passages may be freely irrigable yet show the condition. Extirpation of the sac is the remedy. (Eight excellent photomicrographs.) *H. Rommel Hildreth.*

Mikaeljan, R. C. **Studies on pneumococcus in the eye.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 778. (See Section 6, Cornea and sclera.)

Motegi, A. **Topography of the cilia at the medial angle of the lids.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 784. (Ill.)

Motegi examined 523 eye patients, without pathological disturbances of the cilia, and found cilia at the medial angle in cold Kuschiro, 42 degrees northern latitude, and hot Taihoku at 25 degrees latitude in from 84.1 to 62.7 percent respectively. The like percentages were found in 125 perfectly normal soldiers. The longest cilium was from 6 to 7 mm. The cilia are not noticeable in the first year of life and are not perfectly developed before the tenth year. At the temporal angle they are lacking for 1 to 2.5 mm. around the canthus. Three types of rows of cilia are distinguished: the first having no cilia at the lacrimal part of the lid border, the second with arcuate cilia along the border, and the third with tufts of cilia at the medial canthus.

C. Zimmermann.

Petrović, A., and Tschemolossow, A. **May a connection between Gunn's phenomenon and the hypophysis be assumed?** Klin. M. f. Augenh., 1932, v. 88, Jan., p. 87.

A woman aged thirty-nine years showed Gunn's phenomenon, that is slight ptosis of the left upper lid, the lid being greatly raised on downward movement of the lower jaw, or on looking down, but not when looking straight forward or upward. By considerable contraction of the left orbicularis, the patient could prevent the raising of the lid after opening the mouth. Roentgen ray study revealed enlargement of the hypophysis, which was not diseased, as the lack of acromegalic symptoms proved. The question of a connection between enlargement of the hypophysis and Gunn's phenomenon may be solved by further investigation.

C. Zimmermann.

Sattler, C. H. **Operations on the lacrimal canaliculi.** Zeit. f. Augenh., 1931, v. 75, Oct., p. 237.

Slitting of the canaliculi is a useful procedure which is often overdone. In three instances tearing persisted after a Toti operation which had made the duct patent, and Sattler was able to cure the patient of epiphora by reconstructing the canaliculus which had been excessively slit. To bring this about he freshens the edges of the canal wall and sews with woman's hair. Where tearing is due to an eversion of the lower punctum he excises a piece of conjunctiva and subconjunctival tissue over the canaliculus and thus

causes the punctum to again dip into the lacus lacrimalis. In two patients he was able to successfully suture a torn canaliculus by bringing the ends into position over a conical probe. In congenital absence of the punctum or when it has been closed by scar tissue he opens the tear sac, probes from below, and inserts a strand of catgut. After three weeks of drainage normal function is restored.

F. Herbert Haessler.

15. TUMORS

Barrow, R H. B., and Stallard, H. B. **A case of primary melanocarcinoma of the ciliary body.** Brit. Jour. Ophth., 1932, v. 16, Feb., p. 98.

In a male aged sixty-one years the authors observed a swelling on the iris and in the filtration angle at the six o'clock position. The summit impinged on the posterior aspect of the cornea. The mass did not extend to the free margin of the iris. The lens was opaque in the vicinity of the neoplasm and the opacity had spread upward to the pupillary area. The tension was normal and there was no evidence of an inflammatory lesion. General examination failed to reveal a neoplasm elsewhere in the body. The sectioned eye gave a diagnosis of primary melanocarcinoma of the ciliary body. The patient had been carefully examined two years previously, at which time vision was normal and there was no evidence of pathology. (One illustration and three microphotographs.)

D. F. Harbridge.

Corrado, A. **Metastatic sarcoma of the ciliary body.** Arch. di Ottal., 1931, v. 38, Sept., p. 508.

Since Virchow's pronouncement that "organs or tissues in which primary tumors occur by predilection are rarely the seat of the same species of metastatic neoplasm", many authors have verified the rarity of uveal carcinoma of metastatic origin, and sarcoma is even more infrequent. A summary is made of all of the cases that have been reported. The list includes one, published in 1894 by Meigs and de Schweinitz, of a choroidal sarcoma of mediastinal origin. The case reported is that of a man of twenty-six years. He had been rejected from military service because of defective chest development. Six years earlier he had noticed on the calf of his right leg a brown spot which gradually increased in size. Two years later, after striking the affected spot against a chair, the surface remained open and a serous fluid exuded. After the injury the diseased area rapidly increased in size and became knotty.

On July 17, 1921, the neoplasm had become very painful and had grown to the size of a fist. It was then satisfactorily removed together with some cervical and inguinal glands which had become involved. The December following, a bluish node appeared on the site of the wound and was removed. In April, 1930, a bluish enlargement which had appeared in the cervical region was excised. Shortly afterward the patient had an attack of pleurisy. Various other small dark nodes appeared and were removed. In October, 1930, a shadow obscured the left visual field. After a few days, lacrimation, marked subcutaneous venous congestion of the palpebral border, and pericorneal injection were noticed. On everting the upper lid a dark spot was observed at the tarsal margin. On the nasal side of the anterior chamber a brown oval mass of uneven surface occupied the iridocorneal margin. There was beginning opacity of the lens, with hypotony of the globe. The pain becoming intense, the globe was enucleated. A year later the patient appeared with no recurrence of the disease in the left orbit but a dark spot in an area in the opposite eye corresponding to that which had been affected in the first eye. This developed in much the same way. Pathological examination of the enucleated eye demonstrated the presence of a melanosarcoma which had completely destroyed the iris surfaces in contact with the aqueous. The case is noteworthy in that in only four cases, those of Meigs and de Schweinitz, Wiener, Parsons, and Jensen, have bilateral metastatis to the choroid been observed. The author believes that more instances of this kind might be found by examina-

tion of the eyes of patients dying of carcinoma in other organs. (Bibliography.)
Park Lewis.

Dallos, J. **Two cases of melanosis bulbi.** Arch. f. Augenh., 1932, v. 105, Jan., pp. 542-546.

Dallos reports two cases of melanosis bulbi in women fifty-four and sixty-five years of age. There was diffuse pigmentation of the sclera, the bulbar and palpebral conjunctiva, and at the limbus. In one patient there was a melanoma of the retina. *Frederick C. Cordes.*

Davis, A. H., and Garret, D. L. **Rare orbital tumor in child (epithelioma adenoides cysticum): case report.** Jour. Oklahoma State Med. Assoc., 1931, v. 24, Dec., p. 406.

After reviewing the various types of orbital tumor, the author reports a case of epithelioma adenoides cysticum, more commonly known as cylindroma. A child five years of age was seen because of protrusion of the left eye, with a history that seven months earlier the mother had noticed a slight bulging of the left eye for which nothing was done and which eventually disappeared. Three months later the bulging was again seen and this time it rapidly increased. The vision became poor, and the child was irritable and complained of headache. Examination of the eyes at this time showed the right to be normal. There was a marked downward and outward protrusion of the left globe, with the vision practically nil. The media of this eye were clear, the disc was swollen two diopters, the veins were swollen and tortuous but there were no exudates or hemorrhages. X-ray examination of the skull showed a disturbance in the bony outline of the external aspect of the orbit. The lateral wall of the orbit was resected and malignant tumor found. The entire orbital contents were exenterated and radium inserted. The microscopic report stated: ". . . the epithelium is cuboidal, deep staining, and forms cords and nests which show various degrees of dilatation with cystic contents of mucinous material." *M. E. Marcove.*

Heinsius, E. **The very smallest choroidal sarcomas.** Graefe's Arch., 1931, v. 127, pts. 2 and 3, pp. 458-486.

A spindle-celled, choroidal sarcoma, 6 mm. long and 2 mm. high, was situated between the macula and disc in the right eye of a wheelwright, forty-four years of age. The tumor had sent three elongations into and around the disc and into the sclera along perivascular lymph spaces, and several infiltrations into the choroid, but was on the whole sharply delimited. The very unfavorable prognosis lies in the strong tendency on the part of these smallest sarcomas to break through into blood and lymph vessels, or to metastasize without increasing in size. *E. S. Buss.*

Hippel, E. **Angioma of the choroid.** Graefe's Arch., 1931, v. 127, p. 46.

The ophthalmoscopic appearance of angioma of the choroid has been reported in but four cases. The author reports this appearance in a fifth case, with anatomical findings in this eye and in another eye where an ophthalmoscopic examination was not possible.

A woman had noticed for fifteen months a diminution of vision in the right eye. The ophthalmoscope showed a flat elevation above the disc. After enucleation, a typical angioma of the choroid was found, to the papilla.

The second eyeball was removed from a woman of twenty-four years. A calcareous lens had dislocated into the anterior chamber. Glaucoma was present. The vision in this eye had been poor since youth, and was nil at the time of enucleation. Anatomically, a large angioma of the choroid occupied the posterior half of the eyeball. Its inner surface was covered by a mass of bone which was even thicker than the angioma itself. The retina was completely detached.

Since it is impossible ophthalmoscopically to differentiate angioma from sarcoma of the choroid the possible presence of angioma in some other visible part of the body is of considerable importance for the ocular diagnosis.
H. D. Lamb.

Kreibig, Wilhelm. **Metastatic hypernephroma.** Zeit. f. Augenh., 1931, v. 75, Nov., p. 327.

In a thirty-eight-year-old man metastases from a hypernephroma of the kidney were found in the eye, lungs, liver, and mediastinal lymph nodes. The eye tumor gave the first symptom of disease in this patient. An unusual finding in metastatic tumor was a nodular protrusion into the vitreous. Usually the choroid becomes diffusely infiltrated. The retina did not become detached but was split. Whereas proliferation through the sclera is uncommon in metastatic tumors, this hypernephroma entered the sclera along the course of a posterior ciliary nerve and grew among the scleral fibers. *F. Herbert Haessler.*

Kunz, Eberhard. **Sarcoma of the iris.** Zeit. f. Augenh., 1931, v. 75, Oct., p. 257.

The author observed a sixty-seven-year-old gardener with a sharply circumscribed pale melanosarcoma. There was no sign of recurrence two months after its excision by iridectomy. Wintersteiner advocates iridectomy and cites eighteen cases. A local recurrence is easily observed and can be treated by enucleation. Papolczy always enucleates and is unequivocally opposed to iridectomy. *F. Herbert Haessler.*

Lehmann, C. F. **Epithelioma of the eyelid.** Texas State Jour. Med., 1931, v. 27, Oct., p. 422.

The author reports the results of treatment in 113 cases of epithelioma of the eyelid treated with radium. The small tumors were treated with steel or platinum needles inserted into the growth from one and a half to two hours with the former and from two and a half to three hours with the latter. The author believes that with the platinum needles there is less escharotic effect because more of the beta rays are filtered. In larger growths, he uses several small needles or one large heavily filtered needle. The former has the advantage that the effect is confined to the immediate vicinity of the growth and that softer rays (beta) are produced. The latter is used when it is impossible to get a small needle near the base of the growth or because the total dose must be so great that the escharotic effect would be undesirable. Depending upon the filtration, the effective dose of gamma rays to epithelioma varies from 400 to 1000 mg. hours. In this series, cataract as a remote sequel was not noticed after three to five years following beta radiation; but the author states nevertheless that massive doses of gamma rays may be followed in three to five years by cataract, although this is very rare. (Discussion.) *M. E. Marcove.*

Less-Simkovits, Margarete. **Alteration of the eyeball by pressure of an orbital tumor.** Zeit. f. Augenh., 1931, v. 75, Oct., p. 264.

In a sixty-eight-year-old woman a tumor had so displaced the eyeball that the cornea was directed upward and only became visible on lifting the upper lid, while the tumor itself protruded from the lid slit. The eyeball was extremely flattened and completely degenerated within. The histological findings are reported in detail.
F. Herbert Haessler.

Mawas, J., and d'Antrevaux, Y. **Glioma of the optic nerve.** Bull. Soc. Franç. d'Opht., 1930, p. 389.

A case of primary tumor of the optic nerve, corresponding to a glioma with fibrillary predominance, is described. The article includes a detailed clinical and histopathologic examination, with drawings of gross and microscopic sections. *Phillips Thygeson.*

Papolezy, Franz. **Primary carcinoma of the cornea.** Arch. f. Augenh., 1932. v. 105, Jan., pp. 537-541.

Papolezy reports a primary carcinoma of the cornea. He feels that only when there is normal corneal tissue between the tumor and the limbus can these tumors be classed as primary in the cornea. *Frederick C. Cordes.*

Towbin, B. G. **A case of epibulbar leucosarcoma.** Graefe's Arch., 1931, v. 126, p. 639.

A woman fifty-five years old consulted the eye clinic at Kasan because of a large rose-red neoplasm astride the lower outer quadrant of the limbus of the right eye. The patient stated that seven years previously a kind of "heat-blister" had developed at this spot, but that it had not appeared to increase in size until about six months previously. The tumor presented a round form with a smooth covering surface, which however was coarsely nodular. It was about 1 cm. thick; the larger part lay over the sclera. It was immovable, fairly dense in consistency, not painful, and bled easily. Many conjunctival bloodvessels extended to the neoplasm. Vision in the eye with correction was 1.0. Microscopic sections from the growth showed large round cells with central nuclei. No pigment could be detected. *H. D. Lamb.*

16. INJURIES

Gasteiger, H. **Eye muscle injury in forceps delivery.** Arch. f. Augenh., 1932, v. 105, Jan., pp. 460-467.

Gasteiger reports two cases of forceps delivery with eye muscle injury. In the first patient, the right eye had a partial oculomotor palsy. Upon looking down, there was retraction of the upper lid (pseudo-Graefe sign). This could be explained as a peripheral lesion due to injury of the base of skull accompanied by either hemorrhage or direct injury to the nerve. In the left eye, there was ptosis, miosis, enophthalmos, and heterochromia, all of which could result from a lesion of the cervical sympathetic.

In the second patient, there was ptosis of the left upper lid. Upon opening the mouth, and especially when the lower lid was moved to the right side, the upper lid retracted. The case was a typical one of associated movements probably due to supranuclear changes. Inasmuch as these cases are also seen in so-called normal deliveries, it is debatable whether or not the second case was due to birth trauma.

Frederick C. Cordes.

Rezende, C., and Campos, C. **Comberg process for localization of intraocular foreign bodies.** Revista de Ophthalmologia de S. Paulo (Brazil), 1931, v. 1, no. 1, pp. 37-50.

The authors describe Comberg's method, in which the location of the foreign body is charted from two radiographs made in the frontal and meridional axes of the eyeball with the help of a contact glass of the Comberg model, provided with four points opaque to the x-rays. *W. H. Crisp.*

Roščin. **The pathologic anatomy of the eye in Berlin's commotio retinæ.** Graefe's Arch., 1931, v. 127, pp. 401-413.

This condition has been the subject of much controversy. It has been described as a temporary anemia, but more frequently as an edema. The specimens for the present microscopic study were obtained from a farmer's boy aged seven years who had been blinded by a kick from a horse, the hoof striking the bridge of the nose, tearing a deep oblique wound from below the left eye to above the right eye. The ophthalmoscopic picture was similar in the two eyes. There were dull white opaque portions in the fundus external to the "yellow spot". These, which became fused, possessed tonguelike projections extending to the equator. Retinal vessels were in strong relief, especially in these grayish-white patches, and showed no kinking either upon entering these fields or leaving them.

Death occurred eighteen hours after the injury, and the eyes were enucleated two hours later. The pathologic picture in both eyes was strikingly similar and far more complicated than the ophthalmoscopic, which had failed to show tears of optic nerve and retina, and detachment of ciliary body, choroid, and retina. Sections showed that the white opacities in the retina were edematous. The author concludes that in cases of commotio retinæ less severe than the case here cited, the combination of a certain amount of laceration of the retinal tissue with dilatation of the retinal blood vessels is sufficient to explain the ophthalmic picture.

E. S. Buss.

Schneider, R. **Nodular conjunctivitis from fat impregnation.** Zeit. f. Augenh., 1931, v. 75, Nov., p. 369.

The author observed a nodular conjunctivitis in a woman of sixty-three years in whom for years chronic conjunctivitis had been treated with ointment. Elschnig first described the condition and demonstrated chemically that the fatty infiltrations in the mucosa consisted of vaseline or paraffin: The author obtained three somewhat unsatisfactory sections from a piece of tissue obtained at biopsy. In one area the epithelium dipped very deeply into the tissue and the hollow between two papillæ was filled with fat. It was not possible to say precisely how the fat had entered. *F. Herbert Haessler.*

17. SYSTEMIC DISEASES AND PARASITES

Collin, L. **Ocular sporganosis in Annam.** Bull. Soc. Franç. d'Opht., 1930, p. 395.

The larval form of a variety of tapeworm (Dibothriocephalus mansoni) produces among the Annamites frequent and grave ocular disorders which are known in Indo-China under the name of "ocular sparganosis". Since 1922 it has become a frequent affection. The disease usually localizes in the palpebro-orbital region, where it appears as an indurated nodule attaining the size of an almond, and accompanied by pain, inflammation, palpebral edema, lacrimation, and ptosis.

Histologically the lesion consists of a periorbital fibrosis, diffuse or pseudocystic, which is a direct result of the passage or encystment of the larvæ. Treatment consists in rapid and complete excision of the masses.

Phillips Thygeson.

Faulkner, E. R. **The place of the otorhinolaryngologist in the treatment of eye diseases.** New York State Jour. of Med., 1931, v. 31, Nov., p. 1386.

The author discusses, from the otolaryngological standpoint, the relation of various eye conditions to focal infection. Orbital cellulitis is always due to infection of the sinuses, especially the ethmoids. The commonest mistake made by the overzealous operator is to operate in the acute stage. By conservative treatment, twenty-five percent of the cases will never come to operation. Infection of the lacrimal sac may be secondary to infection in the nose and will not clear up until the intranasal condition is treated. When the tonsils are suspected the diagnosis can be made positively. Infections of the middle ear rarely cause secondary eye symptoms, although if other foci are negative it may be well to investigate this source. *M. E. Marcove.*

Junius, Paul. **Disturbances of lipoid metabolism in relation to the eye.** Zeit. f. Augenh., 1932, v. 76, Jan., p. 129.

Disturbances of lipoid metabolism have recently occupied the attention of the internists. Since they sometimes become manifest in the eye, Junius calls the attention of oculists to these syndromes.

Spleno-hepatomegaly of the type of Niemann is familial, begins in infancy, and ends in early death. Liver and spleen are enormously enlarged, and contain yellowish inclusions of complex mixtures of lipoids rich in phosphorus, especially lecithin. Lymph nodes, bone marrow, and suprarenals are also involved.

In contrast with the former, Gaucher's syndrome is characterized by ultrachronic course, with large spleen and liver, and involvement of the bone marrow. Skin and bone marrow become brown. Phosphorus-free lipoids, cerebrosides, occur in large, so-called Gaucher cells, with which the tissues become infiltrated. The disease is usually seen in adults but may occur in infants. It seems to be primary in the spleen. There may also be destruction of bone.

In a third disease, the syndrome of Schüller and Christian, bone destruction dominates the picture. Dehiscences in the skull with exophthalmos and diabetes insipidus are of interest to the oculist. This disease is a cholesterin lipoidosis which is localized in the dura, and pressure on parts of the brain may give rise to manifestations similar to

those of brain tumor. The region of the chiasm almost always becomes involved. Liver and spleen are rarely involved, and at most microscopically demonstrable lipoid invasions are found in these organs.

A recent physiochemical study by Epstein explains some of the differences in the manifestation of these syndromes. The lipoid of the Niemann-Pick syndrome is hydrophilic and tends to become extremely finely involved. The pathological career of the highly dispersed lipoid is responsible for the malignancy of the disease. The lipoids found in the other two diseases are hydrophobic and therefore tend to agglutinate into coarse masses against which the tissue cells can more readily defend themselves. This accounts for the chronic course.

The cells which are concerned with the morbid metabolism in the three syndromes described, and also in xanthomotosis, are those of the reticuloendothelial system. In a supplementary paragraph Junius briefly calls attention to some findings which suggest that a study of the lipoid metabolism may throw light on some retinal lesions. Lindow found a morphologic similarity between the cerebral ganglion cells in an infant which had died of Gaucher's disease and the retinal ganglion cells in amaurotic idiocy. The tinctorial reactions however were different. Similarly significant is the work of Berger and Vallie on angioreticular xanthoma of the retina, a contribution to the study of Hippel-Lindau disease.

F. Herbert Haessler.

Junius, Paul. **Relation of diseases of the skin to diseases of the eye.** Zentralblatt f. Haut-u. Geschlechtskrankheiten, 1931, v. 38, pp. 1-35.

The article is a compilation of recent literature dealing with the ophthalmological complications of skin disease, and is intended as a guide to practitioners. Considerable space is devoted to lues and gonorrhea. Junius discusses also the ocular complications of tuberculosis, lepra, xeroderma pigmentosum, vitiligo, rosacea, scleroderma, pemphigus, pellagra, blastomycosis, purpura, and other skin disorders. The various lesions are illustrated by case histories. Reference is also made to occupational diseases. *Frederick C. Cordes.*

Kankrov, A. L. **The fourth case of echinococcus of the orbit.** Russkii Opht. Jour., 1931, Aug., p. 124.

The author reports his fourth case of orbital echinococcus. The patient, a woman aged sixty-five years, presented signs of an orbital tumor in the area of the lacrimal gland. Because of a marked eosinophilia (twelve percent) echinococcus was suspected. The anaphylactic reaction of Ithurat-Gazzoni was only suspicious, but Ullenhut's intracutaneous test was strongly positive. An operation for removal of the cyst was advised. This was carried out under a local anesthetic several months later, when the patient was in a state of advanced general toxemia. During the operation the capsule of the cyst ruptured, and its contents contaminated the operative field. A severe allergic reaction followed, and the patient died four days later. The author stresses the importance of early diagnosis, which is greatly facilitated through allergic and serologic tests. In view of the dangerous toxicity of the echinococcic fluid, diagnostic puncture is contraindicated and removal of the cyst must be completed without impairment of the capsule.

M. Beigelman.

Kirwan, E. W. O'G. **Syphilitic diseases of the eye.** Ind. Med. Gaz., 1931, v. 66, Oct., p. 560.

This is a statistical report of the various manifestations of ocular syphilis among the patients attending the eye infirmary of the Medical College of Calcutta during the year 1930. Of the 26,067 patients treated, 788 or 3.02 percent had some ocular manifestation of syphilis. Of these cases 470 had a positive Wassermann. In 318 cases the Wassermann was negative, but of these 149 gave a positive history and 31 showed evidence of hereditary lues. Iritis, optic atrophy, and interstitial kera-

titis were the most frequently encountered, in the order named. Twenty-two cases of juvenile cataract are included in this series, eighteen of which showed a positive Wassermann. A form of gummatous inflammation of the tarsus is described which resembles trachoma, but which clears up readily with specific treatment. *M. E. Marcove.*

Ladekarl, P. M. **Occurrence of eye lesions in infections with bacillus abortus Bang.** Acta Ophth., 1931, v. 9, p. 334.

By subcutaneous inoculation the author infected a number of white mice and guinea pigs with undulant fever, and at various stages of the resulting infection he examined histologically thirty mouse eyes and ten guinea-pig eyes. No pathologic changes could be demonstrated histologically in these eyes. He then instilled a 2000 per c. c. suspension of bacillus abortus into the conjunctival sacs of twenty mice, in ten of which he had scarified the cornea immediately before the instillation. Microscopic examination of these eyes four months later showed no pathologic changes, nor did the animals show signs of general infection.

Ray K. Daily.

Lane, Laura A. **Practical points in ophthalmic practice. A study of recent food researches.** Jour. Amer. Med. Assoc., 1932, v. 98, Feb. 27, p. 726.

Evidence is offered that one of the most constant signs of food deficiency is pigmentation of the conjunctiva and reduction of the light sense. The retina stores vitamin A, and an avitaminosis causes an increase of lipoids in the rods of the retina and decreases the visual purple. Lack of vitamin A has been responsible for epidemics of hemeralopia, xerophthalmia, and keratomalacia. Vitamin A is largely stored in the liver and is much depleted in chronic illnesses; it appears to be concerned largely with preventing infection. Vitamin B is necessary to good nutrition. Lack of vitamin B causes nervousness and irritability, and patients complain of the eyes tiring easily. Vitamin B concentrate added to the diet of those suffering from uveitis of unknown etiology is beneficial. A lack of vitamin C, combined with calcium deficiency, may be responsible for repeated vitreous hemorrhages of unknown etiology.

The mineral salts are potent in regulating the physiologic processes of the body. In American diets calcium is more frequently lacking than any of the other mineral elements. Calcium deficiency occurs in vernal conjunctivitis. (Discussion.) *George H. Stine.*

Lange, C. **Modern diagnosis of syphilis, with special reference to the spinal fluid.** Zeit. f. Augenh., 1931, v. 76, Dec., p. 1.

Clinical and serological findings are not sufficient for the ophthalmologist, and evaluation of spinal fluid findings is of utmost importance. There is no form of syphilis of the central nervous system, the eye, or the ear which is not meningeal in origin. The meningeal changes manifest themselves in increase of cell content and of proteins of the spinal fluid. The important tests of the spinal fluid which must be considered are quantitative albumen measurement, gold and Wassermann reactions, and cell count and globulin increase. The gold reaction and the quantitative albumen test are extremely sensitive. Albumen is present constantly at a level of 20 mg. per c.c. and can be measured reliably. A finding of 22 mgs. per c.c. is doubtful and 24 mgs. is unquestionable proof of a pathological fluid. A positive Wassermann reaction cannot be expected with less than 70 mg. total albumen per c.c. But it is specific. The globulin reaction adds nothing to the information given by the albumen determination. It is not positive until 45 to 50 mg. albumen per c.c. is present. The cell count is not sufficiently exact to compete with albumen determination and there is no cell picture of the fluid on which an etiological diagnosis can be based. The gold reaction is as sensitive as the albumen test. Where it is normal a syphilitic affection of the central nervous system can be excluded. Obviously its specificity cannot be so great as that of the Was-

sermann reaction, because in all reactions, whether chemical or serological, the specificity must decrease as the sensitivity rises. *F. Herbert Haessler.*

Libby, G. F. **General considerations of focal infection with reference to the eye.** Western Jour. of Surg., 1930, v. 38, Dec., pp. 778-783. Trans. Pacific Coast Oto-Ophth. Soc., 1930, v. 18, p. 143.

The writer dwells on the necessity of finding and removing the focus or foci of infection in certain ocular diseases, particularly retrobulbar neuritis; and emphasizes the value of professional cooperation to that end. His contention is supported by detailed case reports, with visual results after many years in some cases. Conclusions are drawn in relation to each reported case. Tuberculosis is considered in the light of a focal infection. Incidentally, the writer emphasizes the human side of ophthalmic practice, especially in regard to the mental effect of what the doctor says or fails to say to his patients. (Discussion.) *W. H. Crisp.*

Linke, Otto. **Ophthalmomyiasis.** Graefe's Arch., 1931, v. 126, p. 644.

The infesting animal here particularly described is the larva of a fly belonging to the family of Tachnidæ. Ophthalmomyiasis is prevalent in very hot climates such as Siberia, India, South America, Morocco, Algiers, and Central Sahara. The author discusses ophthalmomyiasis interna anterior, in which the larva penetrates into the anterior chamber: ophthalmomyiasis interna posterior, characterized by the formation of circumscribed episcleral, phlyctenule-like spots and later a scleral nodule; and ophthalmomyiasis externa, in which the larva remains in the conjunctival sac. *H. D. Lamb.*

Ploman, K. G. **On postdiphtheric ocular changes.** Acta Ophth., 1931, v. 9, p. 221.

Donders, in 1861, was the first to recognize that temporary postdiphtheric impairment in vision is due to a paresis of the ciliary muscle. Since then, numerous reports have been made of most bizarre postdiphtheric ocular complications. Anisocoria, reduced or abolished accommodation, convergence rigidity, reduction or loss of convergence and light reactions, total oculomotor paralysis, unilateral or bilateral ptosis, paralysis of the trochlearis and abducens, and optic neuritis have all been reported. Of 9,821 collected cases of diphtheria, 8.9 percent had paresis of accommodation, and 3.1 percent paresis of the extrinsic ocular muscles; the percentage of paresis rises with the intensity of the infection. One of the author's two cases had paresis of accommodation, of the abducens of both eyes, of the right upper eyelid, and of the right sphincter pupillæ. The second case had paresis of accommodation, weakened reaction of the pupil to accommodation, and bilateral ptosis of the abducens. (Bibliography.)

Ray K. Daily

Szabó, Georg. **Basal meningitis after tuberculosis of the optic nerve.** Klin. M. f. Augenh., 1931, v. 87, Dec., p. 805.

A girl aged six years was admitted to the hospital with the diagnosis of basal tuberculous meningitis, existing for a few days. Four weeks previously vision of her left eye had been impaired, and now it was reduced to light perception. The left disc was very prominent and edematous, the retina yellowish-gray with scattered hemorrhages. After eight days she died. The autopsy showed tuberculous basal meningitis, and in the optic nerve 4 mm. behind the lamina cribrosa the central vessels were encircled by tuberculous granulation tissue which had completely destroyed the nerve fibers. As the meningeal symptoms set in three and a half weeks after the commencement of the visual disturbance, the meningitis had apparently arisen by extension from the tuberculous focus in the optic nerve.

C. Zimmermann.

18. HYGIENE, SOCIOLOGY, EDUCATION AND HISTORY

D'Amico, D. **An oculist who became Pope. John XXI.** Arch. di Ottal., 1931, v. 38, Oct., p. 564.

It is not generally known that the papal throne was once occupied by an oculist-surgeon, Pietro Ispano. His merits were sung indeed by Dante in Il Paradiso. The title of oculist as now understood was given him because of his treatise on ocular therapeutics, entitled "Liber Oculorum". Ispano lived in a transitional period at the end of the middle ages and the beginning of the Renaissance.

He was born at Lisbon some time between 1215 and 1226. His father was a physician and a patrician. He received his instruction in the liberal arts in Paris, where he studied logic, physics, and astrology (then held in equal esteem with the sciences).

His treatise was divided into three parts, on anatomy and physiology, diseases of the eye, and therapeutics local and general. One of his recipes, rather grandiloquently entitled "L'acqua mirabilis ad omnen maculam et visum confortandum", illustrates the polypharmacy of the time. More than twenty samples were distilled first in wine, then in "urina pueri virginis". The superstition of the value of urine in the treatment of the eyes has not disappeared up to the present day. The reviewer has seen an elderly American woman who lost both eyes through bathing them in urine which was probably gonococcic. *Park Lewis.*

Derby, G. S. **The need of medical social service in eye clinics.** Jour. Amer. Med. Assoc., 1932, v. 98, Jan. 30, p. 394.

Medical social service is one of the most potent agencies for advancement of the work in eye clinics, and for furtherance of the movement to prevent loss of vision and to control blindness. Its value should be appreciated and more generally known, and such service should be more widely adopted. (Discussion.) *George H. Stine.*

Irwin, R. B. **Uniform braille for the English-speaking world?** Outlook for the Blind, 1931, v. 25, Dec., p. 135.

This, written by a blind man, is a plea for uniform braille throughout the English-speaking world. This would make available a more varied selection of books at less cost. The chief difference between the American and English books at present is in the number of word contractions and abbreviations. Juvenile literature, especially the textbook variety, would be very little affected, but adult literature would be equally serviceable wherever English is read. *M. E. Marcove.*

Scalinci, N. **The ocular operations of Benvenuto. (The treatment of pannus sarcomatosus.)** Arch. di Ottal., 1931, v. 38, Sept., p. 475.

According to Hirschberg, Benvenuto's teaching was that of the Arabs, who used the term "sabal" to describe a condition which translated into the barbarous medieval Latin became "pannus", meaning a strip or streak. Etymologically "sabal" means to flow under, which is in harmony with the humoral pathology of the Greeks as a "fluxion" or "rheum". While the Arabs used the term "pannus" to indicate the cause of an obscuration of sight, the Salernan school looked on it as an effect, as a veil before the eye. The original texts of some of the earlier writers are reproduced, and plates from works now in the National Library at Naples show the primitive instruments employed for such operations as excision of conjunctival granulations, removal of pterygium, and correction of entropion. Both lacrimal abscess and fistula were recognized and treated.

Park Lewis.

NEWS ITEMS

News items in this issue were received from Drs. G. Oram Ring, Philadelphia; J. Herbert Waite, Boston; William Wilder, Chicago; and Paul T. Moore, Cleveland. News items should reach **Dr. Melville Black, 424 Metropolitan building, Denver,** by the twelfth of the month.

Miscellaneous

The New York Eye and Ear Infirmary received a bequest of $10,000 from Mrs. Alice Shillito.

The Harlem Eye and Ear Hospital was left $25,000 under the will of the late William T. Koch.

The University of Chicago, division of biological sciences, will give a course for the training of laboratory technicians in eye pathology, in conjunction with almost all other pathological fields.

A joint committee of representatives of organizations for the blind, the hard of hearing and the deaf has announced, through the Volta Bureau, that an effort will be made to relieve the plight of the blind-deaf. More than 700 deaf-blind persons have been discovered in the United States and Canada.

The desire has been spontaneously expressed among the friends and patients of the late Dr. George S. Derby that a Fund be created by donations, the principal to be kept intact, and the annual income to be applied under the direction of the Board of Surgeons and the Board of Managers of the Massachusetts Eye and Ear Infirmary to continue projects fostered by Dr. Derby. Among other things it is desired to continue and to widen the application of medical social work to eye clinics, and to provide instruction for medical social workers. Contributions to the Fund should be directed to Mr. James Dean, treasurer, 201 Devonshire Street, Boston, and should be plainly marked "for the George Strong Derby Memorial Fund".

During the year 1931 the American Board for Ophthalmic Examinations held two regular and two special examinations as follows:

Wills Hospital, Philadelphia, June 8, 1931, at which 31 candidates were present. Ample clinical material had been provided by Dr. Francis H. Adler of the Staff, and Mr. Stephen Wierzbicki, Superintendent of the Hospital.

The usual practical and oral examinations on the subjects of External Diseases, Ophthalmoscopy, Pathology and Anatomy, Refraction, Muscles, Perimetry, General Diseases, and Therapeutics and Operations were conducted by the members of the Board assisted by the following: Drs. Alfred Cowan, John N. Evans, Wm. C. Finnoff, Everett L. Goar, LeGrande H. Hardy, Emory Hill, T. B. Holloway, Wm. F. Holzer, Walter B. Lancaster, C. S. O'Brien, Wm. Campbell Posey, A. B. Reese, Warren Reese, Cyrus W. Rutherford, George F. Suker, Isaac S. Tassman, William Zentmayer.

The written examination was held in the afternoon at the Post Graduate Hospital. The following questions were presented:

1. What are the principal field changes in glaucoma simplex?

2. Explain the ophthalmoscopic appearance of primary and secondary optic atrophy.

3. A man of 50 years of age, of a nervous temperament, complains at times of indistinct pain or rather, discomfort, in and around the left eye and some fogginess of vision. R.V. 6/6, L.V. 6/12. No ciliary injection of left eye and pupil appears regular and about 4 mm. in diameter, about 1 mm. more than that of right, and somewhat sluggish in reaction.

Close examination with loupe reveals some tiny dots on the back of the cornea, not enough to obscure the details of the fundus. What other signs and symptoms would you look for to arrive at a diagnosis and what would be your diagnosis?

Discuss the case and its possibilities and outline your treatment.

4. How can you distinguish acquired defective color vision, such as that of toxic amblyopia, from the congenital form?

5. Describe one theory of the mechanism of accommodation.

The Board held its usual executive session at the Union League Club with the following members of the Board present: Drs. Edward C. Ellett, S. Judd Beach, John Green, Luther C. Peter, Walter R. Parker, Wm. H. Wilder. Absent: Drs. William H. Crisp, and John M. Wheeler.

A special examination was held at the Colorado General Hospital, Denver, Colorado, July 23, 1931, at the time of the Colorado Congress of Ophthalmology. Arrangements for the examination and selection of clinical material was taken care of by Dr. James M. Shields. Nine candidates presented themselves for examination. The practical examination on the usual subjects was held in the morning by the following members of the Board: Drs. Green, Peter, and Wilder assisted by Drs. Wm. C. Bane, Wm. M. Bane, Melville Black, Wm. F. Finnoff, Edward Jackson, and Donald O'Rourke. The written examination was held in the afternoon.

No executive session of the Board was held.

The regular autumn examination of the Board was held Saturday, September 12, 1931, at the City Hospital, Indianapolis, previous to the meeting of the American Academy of Ophthalmology and Otolaryngology at French Lick Springs, Indiana. Preparation for this examination had been made and ample material provided by Drs.

Bernard J. Larkin and Robt. J. Masters of Indianapolis.

The usual subjects for practical examination were in charge of members of the Board who were assisted by the following: Drs. Thos. D. Allen, Cecil P. Clark, W. F. Hughes, W. M. James, John H. Judd, C. S. O'Brien, A. B. Reese, Cyrus W. Rutherford, Raymond J. Sisson, Georgiana Theobald.

The oral and practical examination was conducted in the morning while the written examination was held in the afternoon.

The executive session was held in French Lick Springs Hotel on Sunday, September 13, with the following members present: Drs. Beach, Crisp, Green, Parker, Peter, Wheeler, and Wilder. Absent: Drs. Ellett and Greenwood.

A special examination chiefly for persons from New England was held at the Massachusetts Eye and Ear Infirmary, Monday, December 21. Fifteen candidates presented themselves for examination. Dr. Allen Greenwood had arranged for the collection of clinical material. The practical examination was conducted on the usual subjects by the members of the Board: Drs. Beach, Greenwood, Parker, Peter, and Wilder who were assisted by Drs. L. M. Carvill, P. A. Chandler, E. B. Dunphy, E. K. Ellis, W. F. Holzer, W. Holbrook Lowell, Wm. D. Rowland, Benj. Sachs, Theo. L. Terry, J. H. Waite, S. H. Wilkins. The written examination was held in the afternoon.

As this was a special examination, no executive session was held.

Including these four examinations, the Board since 1916, has held in various parts of the country 37 examinations, regular and special, as a result of which 918 persons have received the certificate.

It is interesting to note that the influence of the Board is increasing. The authorities of the Brooklyn Eye and Ear Hospital since January 1, 1931, require the certificate of the American Board for Ophthalmic Examinations as a qualification for promotion to positions on the staff higher than that of clinical assistant.

The second edition of the Directory of persons certificated, arranged alphabetically and geographically, was issued January 1, 1931. A supplement of all persons certificated since that time was issued January 1, 1932, and distributed to all holders of the Directory. Copies of this Directory may be purchased from the Secretary, Dr. Wm. H. Wilder, 122 S. Michigan Avenue, Chicago, at $1.25 per copy.

The Board wishes it to be known that all candidates for its certificates are now required to show that they have been engaged in the special study of and training in ophthalmology for one year and have supplemented this by two years of clinical work in a special ophthalmic hospital or dispensary and with private practice, making altogether three years of preparation before they are eligible to take the examination.

WILLIAM H. WILDER, *Secretary.*

The eleventh intensive European summer course in Ophthalmology will be given in Vienna, Austria, in the summer of 1932, from July 10 to August 12, under the direction of Dr. George W. Mackenzie.

The British Medical Journal, London, contains the announcement that at a meeting of the Council of the Royal College of Surgeons of England, Lord Moynihan, President, in the chair, The Right Hon. Lord Dawson of Penn., P.C., G.C., V.O., K.C.B., K.C.M.G., Physician to His Majesty the King, and President of the Royal College of Physicians of London, and Sir Henry Wellcome, LL.D., F.S.A., founder of the Wellcome Research Institution, were elected Honorary Fellows of the Royal College of Surgeons.

The bestowal of this honor on Sir Henry Wellcome is very exceptional in that aside from members of the Royal Family, Sir Henry is the second person not holding a medical degree upon whom this rare distinction has been conferred, the first and only other recipient being the famous Field Marshal, Lord Roberts of Kandahar.

Sir Henry Wellcome is of American birth and is well known for his world-wide scientific work and extensive pioneer researches in connection with tropical diseases, including the founding of the Wellcome Tropical Research Laboratories at Khartoum on the Upper Nile Regions of the Sudan, Africa. He is also a Director of the Gorgas Memorial Institute, Washington, D.C., with its Tropical Research Laboratories at Panama.

Societies

The Oxford Ophthalmological Congress will be held July 6 to 9, 1932. The usual arrangements have been made for accommodating members in Keble College, Oxford. Inquiries should be addressed to Mr. C. G. Russ Wood, Secretary and Treasurer, Hill House, Abberbury road, Iffley, Oxford.

In accordance with the resolution of the first Latin-American Ophthalmological Reunion, held in Santiago de Chile in February, 1931, the second Reunion will be held in Buenos Aires in September, 1932. The committees of organization, composed of Drs. Raul Argañaraz, Carlos Charlin C, and Amadeo Natale, has appointed a group of honorary presidents, and also an executive committee, which held a preliminary meeting in Buenos Aires on March 2.

The Section on Ophthalmology of the College of Physicians of Philadelphia met on Thursday, April 21. The program was as follows: Dr. George Cross, "Inversion of the iris"; Dr. H. Maxwell Langdon, "Wound of the globe by an explosion of shatter proof wind shield"; "Melanotic sarcoma of the choroid occurring at the optic disc in an eye with a previous simple detachment of the retina"; Dr. Hunter W. Scarlett, "Microphthalmus with coloboma of iris, choroid and disc"; Dr. T. B. Holloway, "Concerning Lebers disease"; Dr. Joseph V. Klauder, "Syphilis in the third generation".

The Société Française d'Ophtalmologie will celebrate its fiftieth anniversary this year. The annual gathering will be from July 18 to 21, 1932, in Paris, and there will be special receptions and a banquet. Inquiries should be addressed to the secretary general, Dr. René Onfray, 6, avenue de la Motte-Picquet, Paris VIIe. This meeting will fit in rather conveniently with the plans of those of our readers who are visiting Europe and expect to attend the one-hundredth anniversary of the British Medical Association, July 21 to 30, 1932.

Dr. M. Luckiesh of the lighting research laboratory of the General Electric Company, at Nela Park, spoke before the Cleveland Ophthalmological Club on April 5, 1932, on the subject "Seeing, a partnership of lighting and vision".

Personals

Dr. Thomas H. Odeneal, formerly of Beverly, Massachusetts, is now associated with Dr. Arthur Walter's Clinic at Miami Beach, Florida.

Dr. Charles A. Bahn has been appointed professor of ophthalmology in the graduate department of the Louisiana State University. He has also been elected president of the New Orleans Ophthalmological and Otolaryngological Society.

Dr. Daniel K. Shute, clinical professor emeritus of ophthalmology, George Washington University Medical School, District of Columbia, received the honorary degree of doctor of science at the bicentennial convocation of the George Washington University.

Dr. Melville Black was the guest of honor at a dinner tendered to him by the Colorado Ophthalmological Society on March 25, 1932. Speakers were Drs. Frank R. Spencer, Edward Jackson, William C. Bane, Robert Levy, and Dean O. C. Lester.

Dr. Thomas B. Holloway, has been appointed a member of the Board of Directors of the National Society for the Prevention of Blindness.

Dr. Ramon Castroviejo has been appointed to the staff of the department of ophthalmology of the medical center, Columbia University.